

InfoWorld

The Newsweekly for Microcomputer Users

October 18, 1982

Volume 4, Number 41

\$1.25

ROMS AWAY (Military Micros)

Texas Company's Last Roundup

Putting More Zip into the Z80

Rolm Tortures Computers

No Nukes Computerists

Swiss Mice



Presenting the computer America is flipping over.

Some computers have a vertical format for word processing. Still others offer a horizontal format for spread sheets.

The Corvus Concept™ gives you both. All in a single unit. By simply flipping the screen.

Whole-page word processing and 13-column one-glance forecasting. No need for scrolling. And no need to resort to a printer.

The Seybold Office Systems Report (June 1982) called it "The most impressive new desk-top computer" at the 1982 Hannover Fair. Byte Magazine (June 1982) said "It will set the price/performance standard in its price class for some time to come."

Besides its dual orientation screen, the Concept has set the pace in memory

capacity with 256 thousand bytes (expandable to 512 kilobytes).

And it's designed to grow with your needs. Every Concept has a built-in network interface that transforms it from a powerful stand-alone computer to a versatile, multi-function workstation on an interactive peripheral-sharing network.

Because it was an idea whose time had come, we called it the Corvus Concept.

You'll call it a miracle.

**. CORVUS SYSTEMS

2029 O'Toole Avenue, San Jose, CA 95131
408/946-7700 TWX: 910-338-0226



InfoWorld

The Newsweekly for Microcomputer Users

Swiss mice roll into U.S. office-automation market



The palm-size Depraz mouse, designed in Switzerland, rolls on a flat surface and controls cursor moves in a corresponding direction on the display screen.

Control cursor, commands, editing change

By John Markoff, IW Staff

PALO ALTO, CA—What do Swiss mice eat? In this case it's not Swiss cheese.

The Depraz mouse, a small palm-size device designed to control cursor movements on a computer display, is now being sold in the U.S. by Logitech, Inc., of Palo Alto, California. The firm is a member of a group of European and American companies involved in office-automation technology.

Many researchers are championing mice as one of the key ingredients of the personal-office work and research station of the future. When using a mouse, you enter data from the keyboard, but most editing changes and many commands come from the mouse.

Mice roll on flat surfaces while the

cursor moves in a corresponding direction on the screen. They also have two or three buttons to communicate specific editing commands.

The Swiss mouse was designed by Professor Jean-Daniel Nicoud of the Federal Institute of Technology in Lausanne, Switzerland. It has been used as the cursor controller for Niklaus Wirth's Lillith computer. Wirth is the inventor of Pascal and Modula 2.

According to Logitech vice-president Pierluigi Zappacosta, the Depraz Mouse has a semi-spherical shape that allows it to fit comfortably into the palm, allowing fine motion control.

Currently, Logitech is planning to use the Depraz mouse with an advanced 8086-based work station that has powerful graphics capabilities. The company is also working on a "Modula 2" machine, a computer that is optimized for using Wirth's new language.

See Swiss mice page 5

Top officer fired/resigns from Osborne

By Paul Freiberger, IW Staff

There is no love lost between Adam Osborne, president of Osborne Computer Corporation and his ex-vice-chairman of the board of directors, Thomas Davidson.

As of Friday, September 24, Davidson was no longer employed at Osborne Computer, where he had worked since the company launched its product, the first portable microcomputer, called the Osborne 1.

Whether Davidson was fired or resigned is a matter of debate. In fact, there are many matters of disagreement between Osborne Computer and Davidson, who served as its vice-president and general manager before becoming vice-chairman of the board.

"Osborne Computer has fired Thomas Davidson from his position," says the company's official announcement. It continues: "Simultaneously, it has accepted his resignation."

The announcement adds that Osborne Computer is contemplating initiation of a civil lawsuit against Davidson for "a fraud breach of his fiduciary duties, breach of contract, unlawful use of company information, misappropriation of trade secrets, diverting corporate opportunity for his personal gain and engaging in conduct amounting to a conflict of interest with the corporation's interests."

Davidson says that he is planning a lawsuit of his own. "I'm going to sue

him [Adam Osborne] for \$10 million. He's trying to cover up the fact that the venture capitalists are trying to replace him, just move Adam off into some slot where he's out of trouble. He acted out of emotion."

Osborne shot back that Davidson "is out of touch with reality and has been for some time."

According to Osborne attorney Jerry Petruzzelli, Davidson had planned to go to work for Access Matrix, a computer company in Mountain View, California, that is developing a portable

computer that will compete with the Osborne 1. "We know that Davidson was talking to them," says Petruzzelli.

Ted Pollard, Access Matrix president, says that his firm has talked to Davidson—"There was consideration along that line"—but adds that "he's not joining the company."

Davidson says he is not going to work for Access. "We could not come to terms," he says. Nor did he provide Access with any proprietary information, adds Davidson. "Its system is

See Osborne, page 5

Texas co. finds no investors; fails

Typical situation for firm using multiple-round financing

By Tom Shea, IW Staff

TEI, a \$5-million-a-year manufacturer of multiuser microcomputers, has gone out of business after 14 years.

The firm, located in Houston, Texas, made the multiuser TEI System 48 as well as mainframes and power supplies.

"We couldn't raise capital, so the banks have taken over," said Dave Bennett, formerly the vice-president of finance. Although the firm has not officially filed for bankruptcy, it is finished. "There's no way to recover from this," Bennett said.

The firm was late shipping some of its systems and was not showing a

profit: when it came time for the last round of financing, TEI could not get the needed infusion of cash.

"Our demise is just a typical situation for a high-tech company using multiple-round-style financing," according to Bennett. He said just when it expected to break into the black financially, the company couldn't find investors.

"It's a lesson in using this style of financing without having a written commitment going in," he said.

The company couldn't afford to file for bankruptcy voluntarily, and it was not ordered to do so involuntarily, so

See TEI, page 5

Zilog's speedy Z80 soups up 8-bit to 16-bit performance

By John Markoff, IW Staff

CAMPBELL, CA—Sixteen-bit microprocessors may be the wave of the future, but the venerable 8-bit micro isn't giving up without a fight.

Zilog, designer and manufacturer of the popular Z80 microprocessor, is now offering an 8-MHz version, the Z80H, in sample quantities.

The introduction of the higher-speed Z80 marks a new performance standard for the chip that has become the processing engine for the majority of first-generation microcomputers.

The Z80H joins 2.5-, 4- and 6-MHz versions of the Z80 and will permit to compete with the "second wave" of 16-bit microprocessors, according to Zilog.

Although the principal use for the new system will be in new microcomputer designs, add-on manufacturers are likely to offer plug-compatible boards to "soup up" existing computers.

The new version of the Z80 will al-

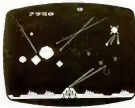
See Zilog, page 5

INDEX

This Week	1	Software Reviews	38
Telecommunications	17	Software News	53
In Focus	21	Hardware Reviews	55
Views	34	Hardware News	65
Software for People	36	Classifieds	67
Special Feature	37	End of File	72

IN FOCUS

The relationship between microcomputers and the military is not limited to bellicose games like this one. Small computers are starting to serve important functions in the U.S. armed forces. For details, please turn to page 21.



This One



InfoWorld 1



DATEBOOK IS FOR YOU.

DATEBOOK™ is an appointment scheduling program for doctors, dentists, attorneys and other professionals.

Using **DATEBOOK** to keep track of your appointments will increase office productivity by saving yourself or your secretary time and frustration.

DATEBOOK can schedule appointments for up to 27 different doctors, lawyers, rooms, etc. It will search for openings that fit time of day, day of week and/or day of year constraints. Three

appointment schedules are displayed on the screen at a time. Appointments are made, modified or cancelled easily. Copies of day's appointments can be printed quickly.

DATEBOOK is designed for the busy professional whose time is at a premium. Let **DATEBOOK** start working for you today.

DATEBOOK is \$295. Manual alone \$30. Add \$7 for shipping and handling.

DATEBOOK requires 56K RAM and CP/M. Also available for CP/M-86, Apple Pascal and UC/SP Pascal.

Formats: 8" 5.25", 5 1/4" NorthStar DD, MicroPlus Mod II/Vector M2, SuperBrain 3.0, Apple II, 5 1/4" and 8" Xerox 800, HP-125 and HP-87, IBM Personal Computer with CP/M-86, IBM DisplayWriter with CP/M-86.

Trademarks: **DATEBOOK**—Organic Software, CP/M, CP/M-86—Digital Research, UC/SP Pascal—Regents of the University of California.



DIGITAL MARKETING CORPORATION
2010 CENTER LANE • MENARD, CA 95336 • CALIFORNIA, 95336
415/338-3880 • Telex 111832 DIGIMKTG UNIVIS

Debit orders require credit. Orders outside California add \$10.00. Add \$10.00 more California add \$10.00. Add \$10.00 more California add \$10.00.

InfoWorld Advertising Representatives

Northwest
InfoWorld, 530 Lytton Ave., Suite 303, Palo Alto, CA 94301 (415) 685-1330
Salesperson: Lynne Matthews
Territory covers: Southern CA, OR, WA, NV, UT, WY, ID, MT, HI, Canada.

Southwest
InfoWorld, 1901 Ave. of the Stars, Suite 1774, Los Angeles, CA 90067 (213) 552-0408
Salesperson: Gary Carter
Territory covers: Southern CA, AZ, NV, HI, Canada.

Rapid Access Marketplace: (415) 479-2212

Midwest
Pattis Group, 4761 W. Touhy Ave., Lincolnwood, IL 60464 (312) 679-1100
Salesperson: Rich Cress, Kevin Cheneay
Territory covers: ND, SD, NE, IA, MO, KS, OK, MN, WI, IL, IN, OH

New England
Mitch Hall Associates, P.O. Box 860, 1200 East St., Westwood, MA 02090 (617) 329-6092
Salesperson: Terri Hamilton
Territory covers: ME, NH, RI, MA, VT, CT

Classified Advertising: (415) 328-4602

New York, New Jersey
Target Media Company, 114 E. Main St., Bogota, NJ 07603 (201) 488-7900
Salesperson: Robert A. D'Ambrosio, Steven Brande

Mid-Atlantic/Southeast
Warren Langer Associates, 1349 N.W. 84th Dr., Coral Springs, FL 33065 (305) 753-4124
Salesperson: Warren Langer
Territory covers: PA, DE, MD, Washington, D.C., VA, NC, SC, FL, GA, AL, NJ, ME, VT, HI

Second-class postage paid at Framingham, MA, and additional mailing offices. PSN 513078. InfoWorld (ISSN 0199-6649) is published weekly except for a single combined issue the first two weeks of January by Popular Computing, Inc., 375 Corbin Road, Box 486, Framingham, MA 01701. Copyright 1982 by Popular Computing, Inc. All rights reserved. Reproduction of material appearing in InfoWorld is forbidden without written permission. Send all requests to Terry Williams, InfoWorld, 530 Lytton Avenue, Palo Alto, CA 94301. InfoWorld will supply camera-ready art for a nominal charge. Single copy price \$2.50. Subscription prices: US—

\$25 a year, Canada, Central and South America—\$65 a year, Europe—\$95 a year, all other countries—\$185 a year. Four weeks notice is required for change of address. Please allow six weeks for new subscription service to begin. InfoWorld can be purchased on 35-mm microfilm through University Microfilms, Periodical Entry Dept., 300 North Zeeb Road, Ann Arbor, MI 48106 (313) 761-4700. IN THE HOPKINS TOLL-FREE LINE, (800) 343-6474. MAIN NUMBER (617) 679-0700. Address all subscription inquiries to InfoWorld, 275 Corbin Road, Box 486, Framingham, MA 01701. Address all editorial correspondence to Editor, Info-

World, 530 Lytton Avenue, Palo Alto, CA 94301. POSTMASTER: Send form 3579 Change of Address to InfoWorld, 275 Corbin Road, Box 486, Framingham, MA 01701.



ABC membership applied for

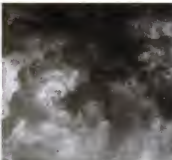
Editor-in-Chief
Maggie Canon
Managing Editor
John Barry
Editor
John C. Dvorak
Senior Editors, West Coast
Paul Heckel, Wallace Kendall, Guy Kenney, Alan Stein, Leon Wortman, John Zuseman
Senior Editors, East Coast
David Needle, Deborah Wise
Senior Writer
Scott Mace
Copy Editors
Eva Hogan, Tanya Kucak, Tom Shea, Patricia Snerov
Hardware, Software Review Coordinator
Barbara Wierzbicki
Contributing Editors
Paul Heckel, Wallace Kendall, Guy Kenney, Alan Stein, Leon Wortman, John Zuseman
Editorial Assistant
Marjorie Gae Brandon

Advertising Director
Roger A. Leen
Advertising Marketing Manager
Robert A. David
National Advertising Coordinator
Bobby Brown
Classified Advertising Manager
Laura Larson
Classified Advertising Coordinator
Delia Daniels
Advertising Assistant
Grace Duarte

Production Manager
Kent W. Hutchings
Production Coordinator
Cynthia Pullig
Typesetting Supervisor
Camille Page Massey
Advertising Production Supervisor
Lauren Katz Tinsley
Pass-up Supervisor
Sahnia Pannutti
Production Assistant
Leah Danahy
Production
Fran Bourquin, Rachel Wasser
Typesetters
Marilyn Lombardi, Ellen Markoff

Marketing Consultant
Bill Perendegast
Circulation Marketing Manager
Nancy Perotot
Circulation Assistant
Rich Richter

Administration
Annette Flemmings, Sheryl Heaney
Administrative Manager
Theresa A. Williams
Publishing Manager
James Regier



Cover: Photograph copyright UPI. Used with permission.

Copyright © 1982 Popular Computing, Inc.
All rights reserved.
InfoWorld Headquarters:
530 Lytton, Palo Alto, CA 94301
(415) 328-4602
Telex: 178073
(InfoWorld PL)



#1 with Words. A+ with Numbers.

Spellbinder Word Processing and Office Management Software.

Spellbinder processes words *and* numbers.

So you save time and improve accuracy in any document: Financial statements. Budgets. Reports. Invoices.

Spellbinder lines up columns of numbers for faster data entry; calculates rows and columns; and puts the totals where you want them.

Spellbinder performs a number of mathematical functions, such as addition, subtraction, and multiplication; extends figures (for example, *6 dictionaries @ \$12.35 = \$74.10*); adds tax to invoices; and displays convenient reference tables.

You can edit numbers within a column, or move a column to a different location. Spellbinder's integrated forms handler saves time and manpower on multiple invoices, reports, and other documents.

The software for discriminating users.

Whether you process numbers or words, you'll appreciate Spellbinder's unrivalled ease-of-use and superior capabilities. Spellbinder and an inexpensive microcomputer easily outperform *dedicated* word processing systems costing *up to three times* more. IBM is a registered trademark of IBM Corporation.

Spellbinder features flexible printing options; mass mailing and legal text capabilities; plus forms handler and boiler plate features for commonly used documents.

Spellbinder makes word processing much easier, much faster, and much less expensive. In fact, many of our users convert from some of the better known (and more costly) systems.

You should be just as discriminating. See your nearest dealer for a demonstration of Spellbinder. Or call Lexisoft at (916) 758-3630.

Now available in 8086 and IBM® Personal Computer format.

Spellbinder
™
**Spellbinder Word Processing
and Office Management System.**

A product of Lexisoft, Inc.
Box 267, Davis, CA 95616 □ (916) 758-3630

**EMERITUS HAS ADDED SOMETHING NEW —
TELEVIDEO CRT'S!**

it's only natural

Since Emeritus has already earned a well-deserved reputation as a reliable, supportive TeleVideo distributor, it's only natural to expand our product line with CRT's from TeleVideo — the world's value leader in CRT terminals! Featuring optional 300/1200 baud integral auto answer/auto dial modems, TeleVideo CRT's are unprecedented in versatility, performance and quality. Emeritus carries the full line of TeleVideo Equipment — now including CRT's — as well as compatible peripherals, and is stocked to ship from inventory within 24 hours! Nationwide field service on all TeleVideo products is available from TRW Service.

Another Business Solution from Emeritus. It's only natural!



EMERITUS™
DISTRIBUTING

Western Regional and Corporate Office
1975 N. Gateway Blvd. • Fresno, CA 93727 • (209) 251-3525

Northwestern Regional Office
(206) 435-1314

Sales exclusively to dealers, OEM's and systems houses.

Zilog

continued from page 1

low system designers to get increased performance.

"The Z80H will give people the ability to obtain 16-bit speed and utilize 16-bit software while retaining 8-bit processors and existing software," said Peter Smidderle, Zilog's Z80 product-line manager.

Performance gained from the Z80H is expected to exceed that of the standard 4-MHz Z80 by four to six times.

The new version of the Z80 has been designed to take advantage of 16-bit peripherals originally intended for Zilog's contender in the 16-bit race, the Z8000.

Smidderle said that there are two

ways to gain more speed from a microprocessor—either by improving process control or by shrinking the mask size, which enables designers to pack individual transistors closer together on the chip. Zilog has gotten more speed from the Z80 by improving process control.

He also noted that 8 MHz was probably not the maximum speed that can be expected from the Z80. "Ten megahertz is in the realm of possibility. We still have a couple of tricks up our sleeve in the way of fine tuning."

Zilog plans to make the Z80H available before the end of the year in production quantities, which means that systems sporting the faster processor may begin showing up for the user before the middle of 1983.

Swiss mice

continued from page 1

According to Zappacosta, the company has also designed a box that will sit between the mouse and the computer and translate motion into keyboard input. Such an interface would permit existing computers and word-processing programs to be converted to use mice. Zappacosta said that no decision has been made yet on marketing the device.

Several U.S. companies are already marketing mice. The most well known is the Hawley mouse, designed by Jack Hawley and manufactured by the Mouse House in Berkeley, California. Researchers at the Xerox Palo Alto Research Center (PARC) have used the

Hawley mouse extensively since 1975. The experimental language Smalltalk, developed at PARC, is designed specifically to take advantage of the mouse as a pointing device.

More recently, several other U.S. companies have begun marketing mice, including an optical mouse from Mouse Systems Corporation in Sunnyvale, California. Optical mice rely on semiconductive devices that sense motion.

Zappacosta said that the Depraz mouse uses optical techniques, which makes it a hybrid between the Mouse Systems and Hawley mice.

The Depraz mouse is priced at \$295, but Logitech is initially planning to sell the device in quantity to system integrators.

TEI

continued from page 1

the company was, at press time, officially "in limbo." Bennett, however, said the banks owned all the equipment and the firm no longer had any employees.

The TEI failure was apparently caused by the tight-money economy and by the firm's financing arrangements more than by product deficiencies. The TEI System 48 received relatively high marks in *InfoWorld* hardware and software reviews, and the system has undergone improvements since those reviews.

"We just had an independent consultant's report that said we had the best product in the marketplace," he said. "It's a shame."

What about customer support for the TEI systems that are in place now? "I really can't say. It's something we haven't resolved yet," Bennett replied. He recognized that there was an ongoing obligation to users of TEI computers, but did not know what arrangements would be made for repair or software support.

Apparently, some customers had an inkling of TEI's difficulties and had some spare parts shipped just before the firm failed.

Osborne

continued from page 1

completely different from the Osborne. It already has 80 columns, double density and is compatible with 8-inch drives."

Development of an 80-column video display and double-density disk capacity has been under way at Osborne since the company announced the computer last year. Ted Pollard will not reveal details of the Access Matrix system other than to say that he plans to introduce it at COMDEX next month.

Was Davidson fired? "No way," says the ex-vice-chairman, who was Osborne's first employee. "I was the guy who started it," he adds.

Davidson, formerly president of a Mountain View company called Integrated Micro Circuits, applied for a position with Osborne in response to an ad in the *Wall Street Journal*.

"Whatever benefits we've had in selling a computer cheap has come from my background in the marketplace," says Davidson.

"THE ONLY SIMPLE THING ABOUT SELECT[™] IS USING IT."

(Geri McCauley, Legal Research)



Geri McCauley's done time. She's processed scores of legal briefs, pleadings and motions and disciplined some pretty disheveled files. But today she pores over legal code, gleaming crucial information and has others process research for her. Geri needed a word processor that didn't make big training demands on her, or her staff. She tried some systems that required special instruction (highly impractical for a busy law firm) and others that crushed enthusiasts with difficult manuals. She chose Select—the only word processor with an exclusive video tutorial that teaches any user right at the computer terminal. And Select does it in 90 minutes, or less.

Sit down in front of a Select and begin by typing "T" for Teach. Don't take your eyes off that screen—you won't need an instruction manual. Command Superspell[™], the multi-thousand word dictionary to catch and correct all your spelling errors. Call up Select's merge print feature to personalize form letters or to construct huge mailing lists. All these features are built-in. No shopping for additional software.

Cross examine Select just by walking into your computer store. When you've finished you'll have a good idea about what distinguishes this expert document manager from the ordinary. It's easy to spot a professional when you are one. Just ask McCauley.



SELECT...The Word Processing People[™]

SELECT INFORMATION SYSTEMS, INC.
919 Sir Francis Drake Boulevard, Kentfield, California, 94040 • (415) 459-4003

* SELECT, SUPERSPELL, and TEACH are trademarks of Select Information Systems, Inc.



Artist's representation of Paradyne's PDS 270 16-bit desktop computer in use

Built-in Pixnet interface adds power to Paradyne upgrade

By Scott Mace, *ITW Staff*
LARGO, FL—A telecommunications company has upgraded one of its terminals into a 16-bit desktop computer running MS-DOS.

By itself, the personal-computer configuration of the Paradyne PDS 270 terminal costs \$6500 in single quantities. An additional box provides two 5¼-inch double-sided, double-density disk drives with 320K of storage, plus 128K of RAM.

The real power of the PDS 270 computer, though, is a built-in interface to

Pixnet, a high-speed synchronous data loop that can support up to 32 devices at data rates up to 250,000 baud. Somewhere along the loop typically is an interactive IBM 3270 computer. When the terminal acts as a personal computer, it uses an Intel 8086 microprocessor; when it operates in the 3270 mode, all CRT and communications functions are controlled by a Z80 microprocessor.

Pixnet cable can reach 5000 feet or up to 15,000 feet when repeater boxes are used every 5000 feet.

Bill Waghorn, Paradyne's manager of product marketing, said the personal-computer upgrade is not an attempt to compete in the mainstream of the personal-computer market. What is not lost on Paradyne, however, is the tremendous demand for high-speed local-area networks among Fortune 1000 companies. Hence Paradyne calls its machine "the personal computer that is also a 3270."

'Migratable to XENIX'

According to Waghorn, any application that runs under the IBM mainframe operating system can run on the PDS 270 computer, except for color and graphics, which will be added next year, as will hard-disk and cartridge-storage options.

Waghorn said Paradyne decided to use MS-DOS as the computer's operating system because it "lends itself to UNIX calls and is migratable to XENIX," a UNIX look-alike.

Software for the 270 computer after its scheduled release in the first quarter of 1983 includes Multiplan, word-processing and general-accounting programs. Paradyne's system will be able to run IBM PC software as well. Languages to be offered include BASIC, COBOL, FORTRAN and Pascal.

The terminal has a 15-inch 80 x 24 screen and adjustable tilt, and it weighs 37.5 pounds. Dot-matrix, daisy-wheel and high-speed line printers are available for the 270.

Paradyne opened its doors in 1968, primarily in the telecommunications and line-control market. When the IBM 4300 series was released, Paradyne followed with its own 32-bit computer, the Response. Since then it has competed in various sectors of the IBM marketplace.

SIMPLICITY:

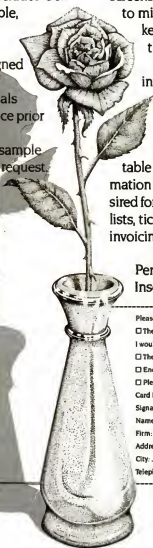
THE ULTIMATE SOFTWARE SOPHISTICATION

THE ACCOUNTANT™ is your alternative to costly and inflexible accounting systems. Organized into four packages, The Accountant is fully menu driven and includes General Ledger, Accounts Receivable, Accounts Payable and Payroll. Using commercially available forms, The Accountant is designed for easy startup and includes comprehensive training manuals and sample data files for practice prior to actual installation.

Detailed information and sample printouts will be mailed upon request. Available directly from Insoft: \$365.00, complete.

DATA DESIGN™ is, quite simply, the most easy-to-use data base manager available. Fully menu driven and complete with help screens, Data Design uses the function keys to minimize learning time and operator keystrokes. Designed specifically for the Personal Computer, Data Design is as powerful as it is simple. All information is entered, viewed, changed and printed through user-created forms. Each form may have up to 40 actual and computed fields, and since each table may use as many as 26 forms, information is always ready in precisely the desired format. Data Design is ideal for mailing lists, tickler files, customer/patient records, invoicing and accounts receivable.

Available in October at your local Personal Computer dealer, or from Insoft: \$225.00.



Please send me more information about:

☐ The Accountant ☐ Data Design

I would like to purchase:

☐ The Accountant for \$365.00 ☐ Data Design for \$225.00

☐ Enclosed is my company check/money order

☐ Please charge my ☐ VISA ☐ MasterCard

Card No. _____ Exp. Date _____

Signature: _____

Name: _____

Firm: _____ Title: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone: _____



Insoft, Inc.
10175 S.W. Barbur Blvd.
Suite 202B
Portland, Oregon 97219
503/244-4181

Both packages support the IBM (Epson) printer and a variety of hard disks.

CP/M™ → IBM
CP/M → DEC
Compatibility with

REFORMAT IER™

Exchange data files with most IBM and DEC equipment through REFORMAT IER disk utilities. With REFORMAT IER you can read and write IBM 5740 and DEC RT-11 formatted diskettes on your CP/M system. Program features bi-directional data transfer and full directory manipulation. ASCII/EBCDIC conversion provided with CP/M-to-IBM.

Each program \$24.00 from stock. Specify CP/M → IBM or CP/M → DEC when ordering.

Program Data Sheets and Application Guide available from Microflex Exports, Inc., 467 Hamilton Ave., Suite 2, Palo Alto, CA 94301 ☐ Tel: 415/324-9114 ☐ TWX: 910-370-7457 MUX-ALTOX ☐ Dealer & OEM discounts available. 

CP/M® is a registered trademark of Digital Research

CP/M[®] IBM[®] APPLE[®] PRICE WAR!

WordStar[®]

\$249

WordStar[®]/MailMerge[™]

\$309

dBASE II[™]

\$489

EasyWriter II[™]

\$269

SuperCalc[™]

\$189

VisiCalc[®]

\$189

Perfect Writer[™]

\$249

SuperWriter[®]

\$249

NOW, PAY LESS, AND GET GREAT SERVICE, TOO!

We know that after you pay plenty for a computer, you don't want to spend a fortune on software. That's why 800-SOFTWARE delivers the finest programs on the market, at the lowest possible price.

How?
By buying enormous quantities of software and selling it at a price you can afford.

You see, 800-SOFTWARE is one of the fastest growing software marketers in the country and we're making our mark by selling the products you want at prices that finally make some sense!

But don't take our word for it. Compare prices (ours include manuals!) and then decide for yourself.

OUR SERVICE CAN'T BE BEAT.

We take care of you like our business depended on it. Because it does.

That's why we provide the fastest delivery you can get anywhere. Which means when you place an order with 800-SOFTWARE, you can be sure that we'll fill it the same day. And that our unique Order Tracking System[™] is keeping tabs on your order, every step of the way.

Our giant inventory—one of the largest in the United States—also assures you of the fastest possible service. Everything's in stock, so you don't have to wait.

ALL MAIL-ORDER SOFTWARE FIRMS ARE NOT ALIKE.

We're not trying to knock the competition. We'd rather let the facts speak for themselves.

FACT: Our prices are the lowest. Compare and prove it to yourself.

FACT: We aggressively seek out the hottest products and negotiate the best deals, so we can save you money.

We were the first mail-order dealer in the United States to stock Perfect Writer[™], the word processor InfoWorld raved about.

(A lot of other mail-order firms still don't stock it.)

FACT: Our technical support and business software expertise is the best you will find anywhere.

One day, when you have a question, you'll be glad you ordered from 800-SOFTWARE.

If you're looking for the finest quality software at incredibly low prices, we invite you to call 800-SOFTWARE today.

We want to prove to you what we've proven to satisfied customers all over the world.

That our prices are lower. That our service is better. That there really and truly is a difference.

We look forward to your call.

CHECK OUT ALL OUR INCREDIBLE BUSINESS CP/M[®] PRICES.

ASHTON-TATE [™]	
dBase II	\$489
DIGITAL RESEARCH [™]	
CBASIC	\$ 99
FOX AND GELLER [™]	
Quickcode	\$229
RUS [™]	
Easywriter II	\$269
EasySpeller	\$139
Easyfiler	\$299
MICROSOFT [®]	
WordStar	\$249
WordStar, MailMerge	\$309
WordStar, MailMerge, SpellStar	\$449
MailMerge	\$ 79
CalcStar	\$199
DataStar	\$199
SpellStar	\$169

SuperSort	\$169
MICROSOFT [™]	
Softcard	\$279
Videoterm (Vides [™])	\$269
RamCard	\$159
All Three Above	\$569
MBASIC	\$279
Enhancer II (Vides [™])	\$109
Basic Compiler	\$295
MICROSTUP [™]	
Cronatalk	\$119
PERFECT SOFTWARE [™]	
Perfect Writer	\$249
Perfect Speller	\$119
Perfect Writer, Perfect Speller	\$349
Perfect Calc	\$149
Perfect Filer	\$279
All Four Perfect Products	\$695

PICKLES AND TROUT [™] (CP/M for IRS Model II and IIb)	\$169
SORCUM [™]	
SuperCalc	\$189
SuperWriter	\$249
SpellGuard	\$179
TCS ACCOUNTING [™]	
General Ledger	\$ 99
Accounts Payable	\$ 99
Accounts Receivable	\$ 99
Payroll	\$ 99
All Four Above	\$289
Inventory Management	\$ 99
TRNDOS Accounting Package	\$289
VSICORP [™]	
VoiCalc	\$189
Other Visicorp Products	C ALL
THE WORD PLUS [™]	\$129

FREE GIFT!

GET 4 FLOPPY DISKETTES FREE WITH ANY PURCHASE, IF YOU ACT NOW!

- ☐ Your choice of 5 1/4" or 8"
☐ Brand new and brand name



It is rare in this day and age to get shipment in five days which was promised in ten—and this is the way my order was filled... I have been very favorably impressed with your prompt and efficient service and excellent prices. **PP**

Peter Sorenson, M.D.,
West Hartford, Connecticut

I very much appreciate your helpfulness and speed in filling my order. Rarely today do I have the opportunity to deal with a firm which shows such a high degree of professional ability. Mahalo and Aloha! **PP**

Joe Neil, Liluke, Hawaii

It is indeed refreshing to deal with people as personable and professional as you have proven to be. **PP**

Dave Turner, U.S.N.,
Lubbock, Texas

Thank you very much for the very prompt service you gave me. I would be delighted to do business with you anytime in the future that you have something I need. **PP**

William Drescher,
Lansing, Michigan

All letters on file.

TO ORDER, CALL

TOLL-FREE:
800-227-4587

In California, 800-622-0678
CA residents add sales tax.

© Copyright 800-SOFTWARE, Inc. 1982

800-SOFTWARE



OR WRITE:
800-SOFTWARE, INC.

185 Berry Street, Suite 6820, San Francisco, CA 94107

- ☐ Purchase orders accepted
☐ Prompt UPS 3 day Blue Label service
☐ Call for shipping charges
☐ Now open Monday through Saturday

Metafile and Professional Blackjack highlight PC+1

By John Unger Zussman

ATLANTIC CITY, NJ—A \$1995 software package, described by its creators as a "complete application system," turned heads at the PC+1 convention held here September 8-11.

The program, called Metafile, was developed by Sensor-based Systems of Chaffield, Minnesota. The PC+1 convention focused on the IBM Personal Computer and marked Metafile's debut on the PC.

Metafile is both a user-application and an application-development system. Its creators have been using it for the past two years to develop turnkey business applications. With the bene-

fit of these applications as field tests, the company has recently released it as a stand-alone package for Vector Graphic and Archive computers and now, for the IBM Personal Computer.

When loaded, Metafile looks like a standard data-base-management program. Users can define a file; add, search for, modify, sort and delete records; and generate reports. Metafile commands are English words such as Describe and Use.

Metafile is unlike most data-management programs, however, in its ability to handle unformatted text as data. "Everything in Metafile is simply information," according to Sensor-

based Systems representative Robert Fetters. This means that Metafile can handle text processing as well as data processing. Users can edit a document as readily as they can edit a data record.

Metafile's structural flexibility means that you can incorporate data from a record into a document. In fact, when information is read into a document in a matrix format, the document resembles a spreadsheet. In this mode, Metafile can help to answer "what if" questions and simulate the operation of a spreadsheet program like VisiCalc.

Metafile users or application devel-

opers can write turnkey application programs in the Metafile language. The program supports graphics and text animation, allowing users to create computer-screen slideshows and self-running demonstrations.

Metafile was originally developed on a time-shared DEC PDP-11 mini-computer, but it required too much central-processor time. "Metafile choked the system," says Fetters. "This application seems unique to microcomputers because it requires its own processor."

"Most programs are linear and one-dimensional," adds Metafile's architect, Don McNeil. "Text-processing systems are two-dimensional, like a piece of paper. Metafile's data-base capability adds a third dimension, and the procedural language adds a fourth. We're two dimensions beyond most existing application programs."

The program runs under the CP/M-80 operating system, which is not provided by IBM as a configuration option. Sensor-based Systems' single-copy price of \$1995 includes Xedex's Baby Blue board, which includes the Z80 microprocessor and the 64K of additional memory that is necessary to run Metafile.

A PC-DOS version and versions for other microprocessors are in development. Run-time packages and quantity discounts are available for system designers and resellers.

PC+1 was not devoted solely to high-priced software. At the other end of the price scale, a software of San Diego, California, announced a \$49.50 data-management program called Creatabase. This program performs standard data-management operations, including file definition, record processing and report generation. It is distinguished primarily by its price, which is substantially lower than that of similar programs currently on the market.



BE CHALLENGED

If you are a talented micro computer specialist, you follow the field closely, you know what's been done and what's expected. —

But you've never seen anything like

SAVVY™

Nobody has.

- A CO-PROCESSOR for the Apple II, with 64-Megabyte Associative Memory, 26 Decimal Digits of Precision, and Hardware Security.
- AN OPERATING SYSTEM that automatically Loads, Links, Overlays, and Executes Application Programs.
- A DATABASE MANAGER that automatically Blocks, Allocates, Opens, and Closes Data Sets.
- MACHINE INTELLIGENCE that automatically Resolves: Program Names, Item Names, Data Types, File Structures, Folder Names, and Instructions to the Robot Programmer™.

- A COMPILER that Produces Self-Loading, Self-Relocating, Serially Reusable Code.
- A PROGRAMMING LANGUAGE that uses Plain-text Language and Machine Intelligence.
- AN ASSOCIATIVE NETWORK in which Machine Intelligence, Operating System, Compiler, Database Manager, Programming Language, and Application Programs are all interconnected in the 64-Megabyte Associative Memory.



Even the developers of this technology haven't seen the end of the possibilities. Accept the challenge of working with SAVVY, and it can become whatever you make it.

Your innovative applications that explore the power of SAVVY will be used in future publicized promotions, with credit given to the developer.

To own SAVVY for \$950.00 contact your local Apple dealer.

To accept the challenge, contact Excalibur, the developers of SAVVY, for detailed information on this remarkable system.

Excalibur Technologies Corp.
Albuquerque, New Mexico
(505) 242-3333

Excalibur

TECHNOLOGIES CORPORATION

SAVVY Marketing International markets and distributes SAVVY the Personal Language™ System.

TM - SAVVY, Robot Programmer, Excalibur Technologies Corp.

TM - Personal Language is a trademark of SAVVY Marketing International.



The perfect T-Shirt for Saturday morning, also makes a great gift! Quality cotton/polyester, silk-screened in black.

Colors: White, Light Blue, Red, Yellow
Sizes: S, M, L, XL

Only \$7.95 plus \$1.50 shipping.

HOW MANY DO YOU WANT? Six or more only \$6.95 plus shipping each. (Ohio residents add sales tax) Send name and address with check or money order today.

SATISFACTION GUARANTEED
DIMENSION 4 DESIGN GROUP

1018 Proprietors Rd. Dept. 0017

Worthington, OH 43085
(allow 4-6 weeks for delivery)

Beaman Porter of Harrison, New York, demonstrated the PC version of its PowerText program, which is also available for the Apple II and III. PowerText features a powerful text-formatting language that allows users to store formats for letters, memos, reports, forms, invoices and other common documents. Once you have defined these formats, you can retrieve them in a document with a single command, as if you were telling a secretary to "take a letter."

"Whereas other word-processing systems emulate a typewriter," explains David Guest, president of Beaman Porter, "PowerText emulates a secretary." Priced at \$399, PowerText includes its own operating system (based on the UCSD P-System) and the UCSD text editor.

A new spreadsheet simulator called the B&L Spreadsheet Program was unveiled by B&L Computer Programs of Boise, Idaho. The program competes with VisiCalc, SuperCalc and other financial-modeling programs. It features true numeric representation and a logical capacity of four million cells (actual capacity is dependent on machine memory). The program supports a color display and lists for \$169.95.

In keeping with PC-1's Atlantic City location, gambling dominated the game software.

Two vendors demonstrated casino-style blackjack programs that simulate a dealer and other players while the user plays against the house. Both programs support color graphics and allow players to select rules among standard options.

PCsoftware's Championship Blackjack, which sells for \$34.95, also includes a tournament mode in which players compete against each other. Although Championship Blackjack will recommend strategy if asked, it is primarily a playing program.

Ken Uston's Professional Blackjack, on the other hand, is primarily a teaching program. Created by Intelligent Statements of Chapel Hill, North Caro-

lina, Professional Blackjack is designed to teach a card-counting system developed by Ken Uston, a Harvard MBA who left a position at the Pacific Stock Exchange to pursue a career in blackjack.

Uston, who appeared at the convention, achieved fame and a "60 Minutes" appearance when he was banned from major casinos for counting cards. The program retails for \$89.95 and can be set to simulate rules at more than 70 American casinos.

Aeon Concepts of Pittsburgh, Penn-

sylvania, premiered its Microcosm game at PC-1. Based on the game of Life, Microcosm simulates a population of microbes over several generations. The object is to nurture the colony so that it grows and flourishes.

Some software at PC-1 was more notable for its format than for its new features or applications.

L.B. Magazette, published in Shreveport, Louisiana, was described as "a magazine on a diskette." Each issue includes PC news, hints and tips, problems and solutions, products and

services, feature articles, a bulletin board and several programs.

Each issue costs \$15, or \$10 if you return a diskette from a previous issue.

Finally, Xedex Corporation of Suffern, New York, announced a collection of public-domain CP/M-80 software that runs on the PC with Xedex's Baby Blue memory/coprocessor board. The collection, which is called the PC/Blue Library, comes on ten diskettes and includes system utilities, languages, games and a mailing-list program for \$75.

MICRO-PRICING™

**DON'T PAY MORE
THAN YOU HAVE TO FOR YOUR
CP/M® AND IBM® SOFTWARE!
AND GET TOLL-FREE TECHNICAL
SUPPORT TO BOOT!**

INTRODUCING

**The MicroPro 3-Packs
from Standard Software Corp.**

WORDSTAR™
MAILMERGE™
SPELLSTAR™

Retail Price \$995
3-Pack Cost \$459

CALCSTAR™
DATASORT™
SUPERSTRT™

Retail Price \$995
3-Pack Cost \$459

To Order Call 800-343-0852

CP/M

dBASE II	WORDSTAR	SUPERCALC	CROSSTALK
\$479	\$289	\$199	\$139
ASHTON-TATE	MICROPRO	SORCIM	MICROSTUF
QUICKCODE	MAILMERGE	PERFECTWRITER	C BASIC 2
\$229	\$89	\$239	\$99
FOX & GELLER	MICROPRO	PERFECT SOFTWARE	DIGITAL RESEARCH
SPELLBINDER	T/MAKER II	SCRATCHPAD	MICROSHIELD
\$279	\$209	\$199	\$149
LEXISOFT	LIFEBOAT	SUPERSOFT	N.G.S.

IBM

SPELLGUARD	WORDSTAR	SUPERCALC
\$199	\$289	\$199
I.S.A.	MICROPRO	SORCIM
EASYSPELLER	MAILMERGE	CONDOR 29-II
\$139	\$89	\$509
I.U.S.	MICROPRO	CONDOR
EASYWRITER II	CROSSTALK	TIM III
\$289	\$139	\$399
I.U.S.	MICROSTUF	I.S.I.

ACCOUNTING PLUS®

General Ledger
Accounts Payable
Accounts Receivable
Payroll
Inventory
Sales Order Entry
Purchase Order Entry
Point of Sale

1 MODULE \$ 400
2 MODULES 750
3 MODULES 1109
4 MODULES 1465
5 MODULES 1820
6 MODULES 2140
7 MODULES 2440
8 MODULES 2720

DIGITAL RESEARCH

MAC 85
SID 85
ZSID 85
TEX 90

DESPOOL \$ 45
PL-1-80 449
BT-80 175
PASCAL MTK 425
CB-80 419
CBASIC 2 99
FOX & GELLER®
QuickScreen 139
dUTIL 69

LIFEBOAT®

T/MAKER II 209
4 MODULES 399
RBT-80 649

MICRO - APP®

S-Basic 259
Selector IV 399

MICROCAFT®

Legal Billing 495
Time Billing 495
Legal Billing Demo 75
Time Billing Demo 75

MICROPRO®

Wordstar \$289
Mailmerge 89
Spellstar 159
Datastar 249
Calcutar 149
Supersort 199
Customization Notes 349
Wordmaster 119

MICROTECH EXPORTS®

REFORMATTER 199
CP/M - IBM
CP/M - DEC

MICROSOFT®

Basic 80 284
Basic Compiler 325
Fortran 80 345
Cobol 80 569
Micro 80 144
Edit 80 84
MU Math/MU Simp 219
MU Lisp/MU Star 165
M-Sort 129

PICKLES & TROUT®

CP/M \$179
CP/M (Hard Disk) 259
SORCIM® 199
Supercalc 199

DATA BASE®

FMS-80 649
CONDOR 20-I 249
CONDOR 20-II 659
CONDOR 20-III 249
CONDOR 20-R 149
CONDOR 20-Q 249

XEROX 820 ACCESSORIES®

DUAL DENSITY
BOARD 395
SERIAL PRINTER
DRIVER 99
SMARTER 129
PARALLEL PRINTER
SOFTWARE 129

99'er TI-Fest for 99/4A enthusiasts

SAN FRANCISCO, CA—Owners of the Texas Instruments 99/4A home computer will gather here October 22-24 to celebrate and play with their machines and products that run on or with them.

"99'er Magazine" is sponsoring the "99'er TI-Fest," which will feature TI-compatible software and peripherals, as well as hand-held programmable systems and electronic learning aids.

The event will include an exhibition, trade show, conference and video-game competition. The whole show is organized around the concept of a "Living Magazine," with floor space at the show arranged along the lines of the content and physical layout of 99'er Magazine.

Tickets for one-day attendance are \$7; two-day tickets are \$10; and three-day tickets are \$12. A "Vid-Kid" pass for the whole weekend is \$7 for kids under 12.

For more information contact 99'er Magazine, 1500 Valley River Drive, Suite 250, Eugene, OR 97401.

ORDER INFO.

AMERICAN EXPRESS, MASTERCARD, VISA, C.O.D.

3% DISCOUNT ON PREPAYMENT
MADE BY CHECK
(SOFTWARE ONLY)

ALL ITEMS SUBJECT TO AVAILABILITY
AND PRICE CHANGE

**LARGEST SELECTION
OF CP/M® SOFTWARE
IN THE U.S.A.**

CP/M® is a Trademark of Digital Research

standard software

CORPORATION OF AMERICA

10 MAZZEO DRIVE, RANDOLPH, MA 02368

617-963-7220

800-343-0852

Hours:
Mon.-Fri. 9 a.m.-5 p.m. E.S.T.
Sat. 9 a.m.-4 p.m.

**PURCHASE ORDERS ACCEPTED FROM QUALIFIED
CORPORATIONS AND INSTITUTIONS**





Selected Shawmut customers with micros will participate in home banking.

Banking on your micro—literally: Boston trial bank-at-home setup

By David Needle, *1W Staff*

BOSTON, MA—The Shawmut Bank of Boston recently announced a pilot home-banking program that will offer financial services to users of personal computers.

Shawmut plans to recruit 100 owners of personal computers to participate in the experiment. Those people, in turn, can perform several banking transactions and financial inquiries, via a free linkup to CompuServe, for a six-month period beginning this November.

[A Shawmut official told *InfoWorld*

at press time that they'd already received "well over" 100 responses to local newspaper ads asking for participants.]

At the end of the six-month period, Shawmut plans to evaluate the idea.

An Apple II, Atari 400 or 800 or Radio Shack Color Computer is required to participate in the project, which is centered in the Boston area. The bank will provide modems to anyone chosen who doesn't have one.

The service will allow the bank's customers to check their account balances, pay bills to local merchants electronically and keep abreast of the latest interest rates, financial services and related information.

'Telebanking'

Shawmut officials would not say whether they are definitely committed to offering such a service to all their customers, although they've already earmarked \$100,000 to carry out the pilot program. The United American Bank in Knoxville, Tennessee, has been offering a similar service (see *InfoWorld*, May 24, 1982) commercially for over a year. That bank currently boasts over 400 "telebankers."

United American, however, sold its customers Radio Shack Color Computers with a membership to CompuServe as part of its bank-at-home service.

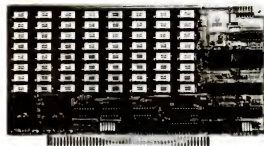
Shawmut is limiting its experiment and any future service to people who already own computers, although there will be an as-yet-unspecified charge for its service when and if it's offered commercially.

Chemical Bank in New York announced a home-banking service of its own (see *InfoWorld*, October 4, 1982) the same day as Shawmut did.

The Shawmut home-banking system will let customers tell the bank to pay third parties or transfer money to different accounts. Users will have to submit, in writing, a list of companies they intend to pay with the service. They will also be able to specify—up to one month in advance—when bills should be paid or other transactions made.

Naturally, the service won't "give" the user money, as an automatic teller can. As one Shawmut official told *InfoWorld*, "We don't think paper money is going to go away."

A FULL LINE OF SEMIDISKS



S-100



TRS 80 Model 2



IBM Personal Computer

Do you use your computer? Or does your computer "use" you? Face it, if you're using floppies, your time is being wasted. Because a floppy is an inefficient random access storage device. Each time the processor wants to transfer data, it has to wait an eternity for the disk to rotate and the head to move.

So what do you do? Get a SemiDisk, quick. It's a large capacity semiconductor memory board that is driven by software to operate like a disk drive. Without all the waiting. Do everything you'd do on a floppy or hard disk, with no modifications to your software or hardware. Two board sizes are available: 512K and 1 Megabyte. (the highest density microcomputer memory board in the world) And you can put up to 8 megabytes in a system by adding more storage boards.

What do you need to use it? Just an S-100 system with CP/M 2.2. Or a TRS-80 Model 2 system with CP/M 2.2. Or an IBM Personal Computer. That's it. No special processors, DMA, I/O, or disk controllers are required. Plug it in and run the installation program, and you're on your way. Fast! Even better, we supply full source code to the driver software, in case you'd like to do your own interfacing.

Best of all, the SemiDisk's price won't warp your wallet. Compare specs, cost/megabyte, storage capacity, and compatibility with the competition. You'll see that the SemiDisk is a disk emulator truly worthy of the name. SemiDisk has battery-backup capability, too.

Consider our limited warranty: A full year, covering all parts and labor. Consider our liberal 15 day return policy. Price? \$1995 for 512K byte SemiDisk, \$2995 for 1 Megabyte SemiDisk. Both from stock. \$10.00 for manual. VISA, Mastercard, COD orders accepted. Dealer and OEM inquiries welcomed. (Specify system type and disk format when ordering.)

Someday, you'll get a SemiDisk.

Until then, you'll just have to wait.

**SemiDisk
SYSTEMS**

P.O. Box GG
Beaverton, OR 97075

(503)-642-3100

Call (503)-646-5510 for CBBS®/NW, a Semi-Disk-equipped computer bulletin board.
SemiDisk trademark of SemiDisk Systems; TRS-80 trademark of Radio Shack



NO WAITING

COLORVERTER 1000

Convert your FRANKLIN ACE 1000 to a color computer in five minutes.

Easy to install!! No soldering!!

\$49.95

Dealers invited.
Cash, check, money order, Mastercard or Visa
Order now from:

COLORVERTER

P.O. Box 8998
Boston, MA 02114
617/232-1847

FRANKLIN and ACE are trademarks of FRANKLIN COMPUTERS CORP.
This product is NOT produced or endorsed by FRANKLIN COMPUTERS.



Strobe brings professional computer graphics down to earth

Picture an Apple II Computer, an Apple Graphics Tablet or Symtec Light Pen, a Strobe 100 Plotter, and Stoneware Graphics Processing Software. With this new low-cost system, you can now create professional level graphics in an extraordinary variety of formats.

Applications from CAD to pie charts

This powerful but easy-to-use system produces isometric drawings for architectural renderings with the same high precision as it does engineering drawings and personal artwork. The resulting multicolor, high-resolution graphics have truly unlimited applications for architects, engineers, scientists, interior designers, art directors, teachers and all business applications.

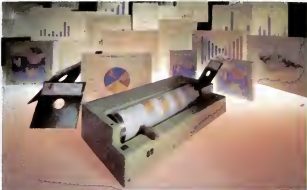
Images can be accurately drawn to scale, altered in proportion both vertically and horizontally, and automatically enlarged or reduced to scale. Portions of the image may be modified or erased without starting over from scratch and any portion may be enlarged 4 or 16 times for greater detail and resolution. Images may be rotated to any new position up to a full 360 degrees.

The system easily handles text for captions and titles and produces large, decorative characters for special emphasis and clarity. The Strobe 100 Plotter brings all this to your next meeting, your next presentation, or your next class—directly on your choice of transparency film or paper.

Strobe, Inc.—Your Single Source

Call or visit Strobe today to learn more about the capabilities of this remarkable new system. In minutes you will see how professional-level computer graphics have been brought down to earth at a very affordable price.

Apple II and Apple Graphics Tablet are trademarks of Apple Computer, Inc. Stoneware Professional Graphics Processing System and Symtec Light Pen are trademarks of Stoneware Corporation and Symtec, Inc., respectively.



Strobe Inc.

897-5A Independence Avenue
Mountain View, CA 94043

Telephone 415/969-5130

The Strobe Graphics System

Seeing is believing

TRS-80, IBM PC can be compatible

By Tom Shea, IW Staff

Two new add-on boards let TRS-80 users run software for the IBM Personal Computer on their Model IIs and IIs and run CP/M software on their Model IIIs.

The two hardware add-ons, developed by independent vendors, open up new domains of software for the Radio Shack computers.

MicroMerlin, from Micro Projects Engineering of Culver City, California,

upgrades TRS-80 Models I and III to be compatible with the IBM PC. The unit incorporates an 8088 microprocessor, 64K of RAM (expandable to 256K) and 8K of EPROM.

MicroMerlin uses the TRS-80 as a slave I/O processor that gives the add-on access to the TRS-80 keyboard, floppy disks and serial and parallel ports, according to Micro Projects.

As an option, you can add an interval timer and priority-interrupt controller chips that will let you run programs on future multitasking operating systems. Serial and parallel ports are also available.

The CP/M-86 operating system is in-

cluded with the hardware, and MS-DOS will be available in early 1983, the company says. Prices start at \$1195.

A San Leandro, California, firm called Memory Merchant lets owners of the TRS-80 Model III tap into the huge pool of software that runs under the CP/M operating system. The product, Shuffleboard II, is a "plug in and run" board that includes 16K of RAM.

Shuffleboard II gives the Model III the power of full 64K CP/M 2.2 without interference of the ROM or the video memory, according to the manufacturer. The board does not interfere with any TRS-80-compatible DOS, such as TRSDOS, NEWDOS or LDOS.



Shuffleboard: TRS-80 CP/M ability

To install the board, you plug the board into two existing sockets inside the Model III. The TRS-80 automatically senses whether a diskette is for the Radio Shack disk-operating system or for CP/M, and it switches to the proper mode.

The board costs \$299, including CP/M 2.2, MBASIC software and an installation and users' manual. ■

Timeshare worldwide with Geisco software

By Deborah Wise, IW Staff

General Electric Information Services Company (Geisco), a subsidiary of General Electric, has developed software to interface microcomputers to its worldwide computer time-sharing network.

Initially, it will offer a package that includes the IBM Personal Computer. Geisco has agreed to buy \$10 million worth of IBM PCs.

Clients who have either Apple II Plus or TRS-80 Model II computers will also be able to link into the GE network. GE will provide the software but will not sell these other computers.

"We feel our clients will need the microcomputers, so we will sell them as part of a total package," said Nancy Jamison at Geisco. The company sells timesharing and specific industry software services to two-thirds of the Fortune 500 companies nationwide, Jamison said. Geisco also sells terminals to clients, but this is the first microcomputer offering it has made.

The IBM PCs, including the GE software, will be sold at the IBM list price.

"[Putting micros on line to timesharing computers] is going to be the way of drawing users," said Sean Sundstrom, manager of market research at Real Decisions Corporation, a Stamford, Connecticut, firm that produces research reports on timesharing companies.

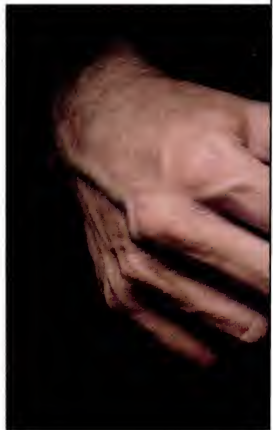
"There has been a lot of talk about this recently, but not much has been done," Sundstrom said. He mentioned he had seen the newly announced Data Resources' DBLink micro-mainframe interface, but that was all. DRI specializes in econometric data, whereas Geisco has a broader range.

"People are going to want to download data and work at the micro level," Sundstrom predicted.

IBM is also starting a timesharing service called Information Network that, in all probability, will also put the IBM PCs on line to a computer processing center. IBM recently announced an emulation capability for the PC that makes it look like a 3270 terminal, an industry-wide standard. Therefore, the PC can now become an intelligent terminal for a number of IBM-compatible computers.

"We believe this linkage will extend the usefulness of the micro. This will be particularly true for multinational firms that need to interconnect PCs in many locations," said Gregory J. J. Lemard, president and chairman of the board of Geisco. ■

How to buy a without ge



No matter how you slice it, the only way you're going to know if a data handling program is right for you is by running it on your computer, solving your problems, your way.

And the only database management system (DBMS) that lets you do that is dBASE II™

A DBMS like the mainframes have.

Conceptually, dBASE II is a relational database management system, like the system IBM introduced on their mainframes last year.

Practically, dBASE II is the most powerful DBMS made for a micro. It handles multiple databases on a single drive and simplifies everything from accounting to project management to monitoring rainfall on the Upper Volta.

With a word or two, you CREATE databases, APPEND new data instantly, UPDATE, MODIFY and REPLACE fields, records and entire databases. Organize months worth of data in minutes with the built-in REPORT. Do sub-field and multi-field searches, then DISPLAY some or all of the data for any conditions you want to apply.

And you've just begun to tap the power of dBASE II.

Easy to look at, easy to use.

Input screens and output forms couldn't be easier—just "paint" your format on the CRT and what you see is what you'll get.

You can do automatic calculations on fields, records and databases, accurate to 10 digits.

And you can use dBASE II interactively for instant answers. Or save your instructions and automate your data handling with two words: DO Finances, DO Rainfall, DO whatever has to be done.

Use dBASE II to help make your choice:

Instead of asking you to pore over a manual, we'll let you try dBASE II free for 30 days.

Send us \$400 and we'll send you a copy of dBASE II that you can run on a 48k Apple with

AMA, GTE offer medical-based electronic information system

By John Markoff, IW Staff

The American Medical Association and the GTE Corporation are creating a new electronic information system that will permit physicians and other health-care professionals to access four on-line data bases and an electronic mail service from virtually anywhere in the nation.

The GTE Telenet Medical Information Network (AMA/NET) will offer data that is licensed and maintained by the AMA. The network will run on host computers based in Vienna, Virginia, the location of the GTE Telenet Communications Corporation.

A spokesperson for the AMA noted

that the new service would be accessible by small computers or through low-cost communicating terminals, such as GTE's Scanet. The spokesperson also stressed that GTE would try to market the service to individual physicians as well as to hospitals and clinics.

The system is scheduled to run field tests in Chicago, Washington, D.C., Los Angeles and Houston and to be available nationwide beginning this month. The data bases will include drug information; disease information; socioeconomic bibliographic information from the MEDSOC data base compiled by the AMA library research staff; and

medical-procedure coding and nomenclature.

The electronic mail system will allow instant communication between the medical community, offer on-line ordering from the bibliographic data base and provide bulletin boards with information on upcoming AMA meetings and continuing medical education (CME) classes.

For the future, planned additions to the AMA/NET include drug alerts, laboratory data, poison-control information, therapy information and the *Clinical Literature Index and Abstracts*. Plans also call for expanding the mail system to provide paperless

insurance-claims processing.

Initially, the AMA/NET information will cost between \$25 and \$27 per hour and MED/MAIL will cost \$7 to \$16 per day, depending on time of day. A one-time subscription fee of \$100 will also be charged. ■

Place order for a 1/2-pounder terminal

By Paul Freiburger, IW Staff

The one-half pound device will connect terminal from Telelogic of Cambridge, Massachusetts, will cut the cost of computer communications considerably.

Telelogic, a manufacturer of microprocessor-based telecommunications equipment, has purchased the exclusive right to manufacture and market a terminal that was developed by an engineer at Arthur D. Little, an international research and consulting firm also located in Cambridge.

The one-half pound device will contain a 1200-baud modem and sell for less than \$100. It resembles a small cradle-like holder for a telephone handset. A touch-tone telephone keypad serves as the input keyboard and you can use a television screen to display the data.

"You just lay the phone receiver on top of the terminal, which attaches to a television set," explains Elliot Millenson, Telelogic marketing director. His company is considering developing its own video display for the device.

William J. Harris, Telelogic president, says that the inexpensive terminal "will make the use of videotex as widespread and accepted as the pocket calculator is today."

"Banking, reservations, news and stock-market reports, telephone messages, correspondence and education represent only the beginning of possible commercial services," he adds.

According to Millenson, potential customers for the terminal include providers of data services and the telephone company.

The Microperipheral Corporation of Seattle, Washington, plans to release a similar product soon. ■

One-day seminars on writing good manuals

PromptDoc of Colorado Springs, Colorado, is sponsoring a user-manual development seminar entitled "Writing User Manuals That Sell." The schedule of the remaining seminars in 1982 follows:

- 10/21 Los Angeles Marriott—CA
- 11/2 Denver Hilton Inn—South
- 11/4 Seattle Red Lion Inn
- 11/16 Dallas Doubletree Inn
- 11/18 Chicago Howard

Johnson—O'Hare

Cost of the seminar is \$145 for a single enrollment, and \$130 for each subsequent enrollment from the same organization. Price covers tuition, materials, lunch and refreshments.

For more information or registration, contact Michele Keplinger at (303) 471-9875. ■

database system getting skinned.



CP/M (\$700 for expanded hard-disk version). Put it through its paces. Then after 30 days, send it back and we'll return your money, no questions asked.

But we don't get many back, because dBASE II is the one database management system that can really cut it.

Call (213) 204-5570 today or drop by your local computer store for the rest of the story.

Ashton-Tate, 9929 Jefferson Blvd.,
Culver City, CA 90230.

Ashton-Tate

©1982 Ashton-Tate
CP/M is a registered trademark of Digital Research

French firm introduces micros to U.S. market

By Deborah Wise, IW Staff

R2E of America, a subsidiary of the French computer giant CII-Honeywell Bull, has introduced its first 16-bit and second 8-bit microcomputer products here, in an attempt to gain a share of the competitive U.S. microcomputer market. R2E of America is based in Roseville, Minnesota.

The world's best-selling microcomputer, the Sinclair ZX81, is made in England, but products developed outside the U.S., even from Japan, have so far made little impact on the U.S. market.

R2E's 16-bit computer, the Mical 90 series, has features similar to many 16-

bit machines already on the market. It is based on the popular 8086 microprocessor and uses the CP/M-86 and multiuser MP/M-86 operating systems. It doesn't run MS-DOS, another widely used 16-bit operating system, but it will support UNIX in the future.

The multiuser version can support up to eight terminals. An average configuration with 256K RAM and two 640K floppy disks costs \$6500.

"Even though there is a lot of 'sameness' between our 16-bit system and others on the market, we feel we have a high-potential product," said Lee Stevens, vice-president of R2E.

In today's market, however, the suc-

cess of the system depends more on the company's distribution and marketing policies than on the computer's features.

"The channels of distribution and the quality of service, training and support are important. R2E didn't have unbounded success with its first product, so I do see problems," said Aaron Goldberg, an analyst at International Data Corporation, a Framingham, Massachusetts, market-research company.

"We have 12 distributors signed up and plan to sell the products directly to major companies," said Stevens. The company also plans a media cam-

paign to advertise its name and products. "I think one of our advantages is that we are an 11-year-old microcomputer company. We introduced the first micro, the Mical N, in France in 1972," Stevens said.

Despite that, Goldberg predicted that R2E would run into difficulties. "Large organizations are a tough sell for nontraditional hardware companies," he said. From a recent survey IDC conducted, Goldberg said "an overwhelming 77% of large organizations chose IBM as their first choice for microcomputer products."

In the future, the Mical 90 series will include a low-end product with "high IBM-compatibility" and a high-end networking system that can act as a communications controller, Stevens said.

R2E's 8-bit series, the Mical 85, is a two-year-old Z80A-based product that has been enhanced with a specially developed software-generating program called XPDYTE.

"A typical business program that would require 52 days to design, define, test, debug, document and modify under manual methods has been produced by R2E in approximately 1.5 days using XPDYTE," claimed Ed Munsch, R2E's product-support manager.

In the past, users have criticized program-generating software because it's just as complicated to tell the program how to write software as it is to write the software manually. R2E claims XPDYTE is easy to use.

A typical Mical 85 configuration with 64K of RAM and 1.2 megabytes of floppy-disk storage costs \$4900.

Both systems support their own versions of BASIC, FORTRAN, COBOL and Pascal as well as applications software from MicroPro and Sorcim. The Mical 85 and 90 series are manufactured in Roseville, Minnesota, and are available for delivery now.

Announcing an Exciting New Way to Make Effective Presentations



Now you can produce professional-looking slide shows—complete with graphs, charts, and special effects—quickly, easily, and economically. All you need is an Apple Computer, a little imagination, and the Executive Briefing System.

The Executive Briefing System is a powerful new software program that transforms your Apple computer into a tool for creating full-color graphic presentations—Dynamic presentations that will make your point or sell your product more effectively.

To see what this exciting new product can do for you, visit your local Apple software dealer today.

LOTUS

55 Wheeler Street, Cambridge, MA, 02138 (617) 482-7171

Software for the IBM Personal Computer SoftCable™

Serial Printing Parallel Processing

Serial Printer Spooling

- Lets you process while printing
- Supports 1 or 2 serial printers
- Buffers output in PC memory
- Uses 1 byte to 500K byte buffers

Flexible Serial Interface

- For any RS-232 ASCII printer
- Emulates LPT1, LPT2, and/or LPT3
- One cable handles most printers
- Busy lead, ETRACK, or XON/XOFF
- Common configurations provided
- Full-screen configuration editor
- Uses COM1, COM2, or both ports

Transparent to DOS & applications
Status, control, and help commands
Allows unspooled parallel printers
Beautifully done, well documented
Reasonably priced at \$59.95

See your IBM PC dealer or contact

The Gauge Group
Box 34082, Phoenix, AZ 85067
(602) 278-1533

NEC booth outdraws IBM, ITT at San Diego TCA conference

By Michael Swaine, IW Staff

SAN DIEGO, CA—The 20th annual TCA Conference and Exposition of the Tele-Communications Association, held here on September 20-25, was a showcase for high-powered telecommunications systems, equipment and services, from satellite-linked mainframe-computer nets to 120-baud modems.

The two exhibit floors and roughly 160 booths gushed with the now-customary (at high-tech shows) radio-controlled "robots" dancing in the aisles; magicians doing card tricks; closed-circuit television monitors showing gawking button-foisted visitors the digitized backs of their heads; and unlimited free coffee, glitter, flash and hype.

One roams the aisles at these shows in a kind of sleepwalking state. One has taken good notes, of course, in which one reads that Italcorn's "Real Italian Espresso" was only so-so, and that, as she climbed onto the robot's back for a ride, a woman named Michelle had blushed and told her gushing friends, "I'm gonna kill you guys when we get back to the office."

Satellite-communications companies abounded, and each one had decorated a map of the world with lighted pins showing its "operational earth stations."

American Satellite, which is providing the extraterrestrial link in remote printing for such newspapers as *The Wall Street Journal*, *The New York Times* and *America Today*, was there with Tandem Computers. Tandem and American Satellite signed an agreement this spring to form a satellite-linked computer network.

StarNet put on a good show, with what was billed as the first U.S. demonstration of wide-screen television. With panoramic video, attendees were told, you can see up to five people at a conference table quite clearly.

NEC's large crowds

Vidcom of Westlake Village, California, and FICS of New York City were showing digitizing pads for teleconferencing and other applications. A digitizing pad linked into a teleconferencing network enables you to draw on CRT screens in offices across the continent; you can even write over video images on the screen.

There were few microcomputers exhibited. Alantush, a Rockville, Maryland, subsidiary of the communications company MA-COM, demonstrated its System 1000, a network work station built around Convergent Technology's distinctive 8086-based microcomputer. There was no sign of another MA-COM subsidiary, Ohio Scientific.

In view of the current perception of ITT and IBM as giants about to go head-to-head in the telecommunications market, it was ironic that their booths faced each other across a central aisle.

NEC was highly visible, with a large booth area. Only companies such as Northern Telecom had larger booths, but no company attracted bigger crowds than NEC. NEC is by far the

largest supplier of INTELSAT earth stations, and has a worldwide telecommunications business.

NEC was showing its micro-processor-controlled telephone systems, high-speed facsimile printer thermal copiers, voice-input terminals, freeze-frame video, fiber-optics links, local-distribution radio and 1200-baud modems.

As popular as anything else NEC was showing, though, was an airline-ticket-reservation demonstration. Although it was strictly for demon-

See TCA conference, page 19



Computer Devices showed its answer to the venerable teletype at TCA.

TO ORDER CALL
(617) 641-1241 in Mass.
1-800-451-2502 outside of Mass.

TECHNICAL SUPPORT
(617) 641-1235

SoftwareBanc

661 MASSACHUSETTS AVENUE, ARLINGTON, MA 02174

THE dBASE II SPECIALISTS

dBASE II™

WE WROTE THE ONLY BOOK

dBASE II™ USER'S GUIDE \$29
FREE WITH dBASE II™!

WE OFFER THE LATEST ACCESSORY PRODUCTS

dUTIL	\$ 69	dBASE II™ UTILITY PACKAGE
QUICKCODE	\$229	dBASE II™ PROGRAM GENERATOR
NEW! ABSTAT	\$379	STATISTICS PACKAGE FOR dBASE II™ FILES

WE STOCK THE WIDEST SELECTION OF dBASE II™

dBASE™ WITH FREE dBASE II™ USERS GUIDE
CALL FOR PRICE

8"	SINGLE DENSITY, TRS-80 MODEL II
5 1/4"	APPLE, NORTHSTAR, SUPERBRAIN, TELEVIDEO, VECTOR GRAPHIC, XEROX, ZENITH Z-89

WE TEACH ALL THE CLASSES

SPONSORED BY SOFTWAREBANC SEMINARS, INC.

DAY 1	INTRODUCTION TO dBASE II™	9AM-5PM \$100
DAY 2	ADVANCED dBASE II™ TECHNIQUES	9AM-5PM \$100

BOSTON
NOV. 8 INTRO
NOV. 7 ADVANCED

CHICAGO
NOV. 20 INTRO
NOV. 21 ADVANCED

DALLAS
OCT. 16 INTRO
OCT. 17 ADVANCED

MIAMI
DEC. 28 INTRO
DEC. 29 ADVANCED

SAN FRANCISCO
OCT. 28 INTRO
OCT. 30 INTRO
OCT. 31 ADVANCED

*SoftwareBanc SAVINGS PLAN: Every purchase increases the discount you receive on that purchase and future purchases.

DISCOUNT SCHEDULE

TOTAL PURCHASE	DISCOUNT RATE
UP TO \$ 499	1%
\$500 TO \$ 999	2%
\$1000 TO \$1499	3%
\$1500 TO \$1999	4%
\$2000 AND UP	5%

The more you buy, the more you save. Invest in the SoftwareBanc today!

Payment may be made by Mastercard, Visa, check, money order, wire transfers. Mass. residents please add 5% sales tax. Add \$5.00 for shipping and handling. Overseas orders add additional \$10.00. Prices subject to change without notice. All items subject to availability. TM - Mfg. Trademark.

10 reasons why you should call DataSource® for software...

- 1. Free Systems Analysis** We have developed a variety of self-administered analysis tools to help you identify those products best suited to meet your needs.
- 2. Competitive Prices** Our volume enables us to offer you prices which are consistently competitive. Compare for yourself, then call us toll-free 800-328-2260.
- 3. Express Service: 7 days per week, 24 hours per day** You can place orders any day of the week at any hour of the day or night. Your order will be processed and shipped within 24 hours for all products in stock.
- 4. Discount Structures** We offer significant discounts to any individual, organization or user's group purchasing in quantity.
- 5. Key Account Program** For corporations and institutions, we offer a comprehensive program: volume discounts, complete maintenance packages with an on-site option, specially staffed technical support, tailored training programs and creative financing options.
- 6. Unconditional Money-Back Guarantee** We stand behind everything we sell. If you are not completely satisfied with your purchase, return the item within 60 days and receive a full refund.
- 7. Toll-Free Technical Support** We service what we sell. Our customers have direct access to our technical staff on a toll-free basis. 800-328-2260.
- 8. National Maintenance Network** We offer a variety of maintenance agreements for both software and hardware products. Call for more information.
- 9. Flexible Payment Options** We accept all major credit cards, checks and money orders, as well as purchase orders from corporate accounts.
- 10. State-of-the-Art Software and Hardware** We carry a broad range of what we believe to be the best in software plus carefully selected hardware products and accessories.

Here's a small sampling of products available now from DataSource®
(If you don't see what you need, just call us at the number below.)

DBMS

dBase II - Ashton-Tate	\$495
Condor II - Condor	\$450
Selector V - Micro-AP	\$395
Data Star - MicroPro	\$225
Super Sort I - MicroPro	\$170

Spreadsheets

Super Calc - Sorcim	\$199
Calc Star - MicroPro	\$185
Visicalc - Visi Corp	\$159
Visicalc 256K - Visi Corp	\$195

Languages

Pascal M+ - Digital Research	\$425
PL-1/80 - Digital Research	\$420
Basic Compiler - Micro Soft	\$310
Basic 80 - Micro Soft	\$275
C Basic - Digital Research	\$125
CB 80 - Digital Research	\$420

Word Processing

Wordstar - MicroPro	\$289
Wordstar/Mailmerge - MicroPro	\$385
Mince - Mark of Unicorn	\$148
The Final Word - Mark of Unicorn	\$250

Spelling

Spellguard - Sorcim	\$225
Spellstar - MicroPro	\$165
The Word - Oasis	\$ 70

Hardware

Smith-Corona TP-1	\$689
Citoh F-10 Star Writer - 40 CPS	\$1,475
Citoh F-10 Printmaster - 55 CPS	Call for price
Citoh Pro Writer	\$515
Citoh Pro Writer-Serial	\$650
Hayes Smart Modem 300	\$230
Hayes Smart Modem 300/1200	Call for price
Signalman MK I Modem	\$ 99

NEW! Only from DataSource®

EMULINK for the IBM PC \$995.00
On-Line Binary/synchronous link to the big IBM host. Full 3270 emulation for the IBM Personal Computer. Complete documentation included with diskette and board.

A product of Micro Link Corporation.

Please include 3% for shipping and handling. Minnesota residents, add 5% sales tax. Prices subject to change without notice.

FOR MORE INFORMATION CALL TOLL-FREE

800-328-2260

IN MINNESOTA, CALL 612-544-3615

DATA SOURCE
systems Corp.

Your source for micro software and hardware

DataSource® Systems Corporation, Dept. 1G, 1660 So. Highway 100, Minneapolis, MN 55416

American Express
MasterCard
Visa



Now yours
for only \$795.00
including interface* and
Strobe Business Graphics Software.



The Strobe Graphics System: \$795. You can pay more but you can't buy more.

How to chart your company's fortune without spending one. It's a fact. A single chart or graph can tell you instantly what it takes hours to interpret from printouts or other raw data.

Now, with the Strobe 100 Graphics Plotter and Software package, you can create superb hardcopy graphics directly from your computer. And you can do it for a cost of only \$795.00.

The Strobe System transforms complex data into dynamic, colorful visuals with a few simple commands from your computer. Charts and transparencies that once took hours to produce are plotted within minutes. Information can be presented as bar charts, pie charts, curves or isometrics in a variety of colors. And with a resolution of 500 points per inch, the Strobe 100 matches or surpasses the quality of plotters costing thousands of dollars more.

You can also save and modify your graphics through Strobe's menu-driven programs. A broad selection of software is now available.

When the Strobe Graphics System is interfaced to your computer, an 8½ x 11 inch sheet of paper can speak anyone's language—visually. Visit your local dealer and learn how to start charting your fortunes today. Because a perspective on the present can also be your window on the future.



*For Apple, Osborne and Commodore computers.
For serial interface, add \$100.00.

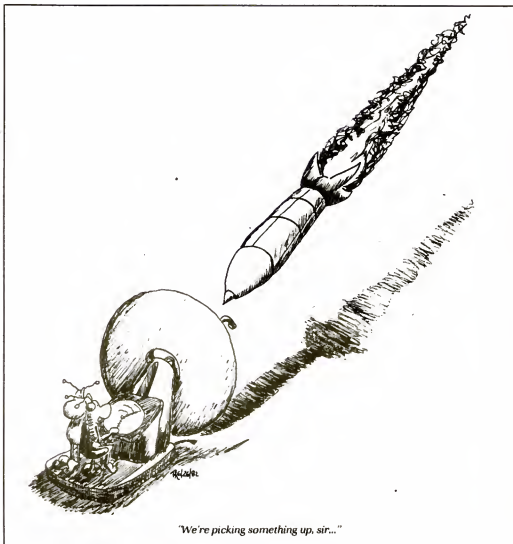


Strobe Inc.
897-5A Independence Avenue
Mountain View, CA 94043
Telephone 415/969-5130

The Strobe Graphics System

Seeing is believing

MILITARY MICROS



"We're picking something up, sir..."

If you've ever played chess against a computer, you know how tough it can be as an opponent. Silently, the silicon logic considers the relative advantages of moves it could make, the consequences of those moves and your likely responses. Sometimes it "thinks over" its next move for as long as 30 minutes.

Then, it moves with cunning to beat you.

Chess is only a game, but it is a symbolic war game: two feudal societies with kings, bishops and other officials do battle according to certain "rules of war." Each player strives to eliminate threatening pieces and finally to immobilize the opponent's king.

The technology behind computerized chess games and personal computers is now playing an active role in late twentieth-century warfare, and its role is not limited to a table game.

The recent Falkland Islands' war provided a dramatic example of the destructive power of "smart" weapons. Britain eventually won that war, but not before an Argentinian fighter pilot stunned the world by destroying a British ship with a single shot.

The Argentine fighter released a French-made Exocet AM39 missile, miles away from the British warship that was its target.

Dropping down to six feet above the surface of the water, the anti-ship missile, manufactured by Aerospatiale, used an embedded microprocessor—a built-in black box—and an active-radar homing device to zero in on the British warship, the HMS Sheffield.

The warship skimmed above the water undetected and blasted

into the side of the ship. The resultant explosion started fires that raged out of control and, finally, sank the destroyer.

The sinking of the Sheffield brought to the foreground the kind of electronic intelligence that is being built into modern weapons. Electronic warfare—EW in military parlance—was seen on the world stage for what it is: a deadly and effective means of destroying men and enemy equipment in war.

Not lost on military observers was the fact that a single "smart" missile costing only a few hundred thousand dollars completely destroyed a powerful warship worth millions of dollars. Clearly, the electronic brain—the embedded microprocessor hardware and special-purpose software—that guides these weapons is now as important a weapon as bullets or high explosives. Micros have gone to war and they seem to be winning.

The U.S. military is also supplied with smart, microprocessor-based weapons. Cockpit displays in such new fighter planes as the F-18 and the F-16 reportedly flash graphics symbols in the pilot's field of vision to enable him to track and fire on enemy planes, missiles and ground targets. These "ordnance-delivery systems" are driven by embedded microprocessors.

Almost every major weapons system is now guided or enhanced by some form of machine intelligence. "Ruggedized" versions of minicomputers that can withstand shock, vibration and

See Military micros, page 22

50 CP/M UTILITIES IN ONE PACKAGE



\$3.00 each

POWER

The first super program that puts YOU in control of CP/M.*

POWER automatically numbers disk files. Just pick file number to Copy, Erase, Reclaim, Rename, Type, etc....Your computer feeds the file names automatically. You do No typing! No typing errors...ever!

YOU DON'T NEED SYSTEM DISK IN ANY DRIVE!
No more BDOS ERRORS!

YOU Test and Fix bad disks! Reclaim accidentally erased files or programs! Single step thru memory up or down! Search, View, Change memory or disk in a snap! See Status and File Size instantly! Verify Checksums for programs! Load or Save programs at any address.

YOUR MAJOR POWER COMMANDS:

DIR	COPY	REN	ERA
TYPE	TYPEH	TYPEA	TYPEX
RUN	EXIT	SIZE	CHECK
STAT	USER	XUSER	TEST
SETDIR	SETSYS	SETRO	SETWR
RECLAIM	DISK	SAVE	LOG
DS	SPEED	READGR	LOAD
READ	WRITE	DUMPH	WRITEGR
DUMP	FILL	CM	DUMPA
MOVE	EX	GO	SEARCH
JP	USR3	USR4	USR1
USR2			?

50 prompted user-friendly functions for housekeeping and a 60 page easy-read users' guide make POWER your most often used software. You'll use it everyday!



ONLY \$149

COMPUTING!

2519A Greenwich
San Francisco, CA
94123.

join other users

E.I. DUPONT	UNION CARBIDE	J. POURCELLE
SPERRY UNIVAC	UC BERKELEY	UC MEDICAL
NY STOCK EXCHANGE	UC SAN FRANCISCO	TYPOGRAPHERS
S100 MICROSYSTEMS	LIVERMORE LABS	CITIES
LES SOLOMON	SORTING PROJECT	& SCHOOL DIST.

TOLLFREE (800) 227-3800 Ext 28.
IN CA: (800) 792-0990 Ext 28.

Military micros

continued from preceding page

extremes of temperature and pressure ride in modern submarines and tanks.

The microprocessors embedded in modern armaments look nothing like the average personal computer. These special-purpose units run on microcode instructions understood only by military technicians with special clearance and training.

Because of the importance of secrecy and the element of surprise, the important details of all these weapons systems are classified, and the armed forces discuss none of these weapons systems officially.

There are other, peacetime uses of microcomputers that the military is happy to talk about, however.

Scott Mace visited the Defense Language Institute in Monterey, California, where computer and video technology is being used to teach foreign languages to students from the armed forces.

Tom Shea reports that the Air Force is using microcomputers throughout its operations for such business purposes as inventory, word processing and accounting.

Tom Shea also takes a look at how one Silicon Valley firm builds, by hand, rugged Data General computers that serve as the nerve centers for surface and submarine warships and control other weapons systems, including cruise missiles.

David Needle examines the Pentagon's language of choice, Ada.

Scott Mace also looks at the Pentagon's attempts to plan the future role of microcomputers in the armed forces.

New microcomputer software

ListMaker

from Reader's Digest

**tops the list for easy,
economical information
management!**

ListMaker is a new, inexpensive, yet powerful software package that can help you manage information efficiently and creatively. Use ListMaker for — real estate listings — subscriber, patient, or customer records — membership rosters — personnel records — and a complete range of direct mail applications, from labels to personalized form letters. Automate all your files with ListMaker and eliminate tedious, time-consuming, and expensive manual searching and paperwork.

ListMaker is easy-to-use, and flexible. It allows you to input information and produce hard copy in the format you need, with ready access and manipulation of records.

ListMaker features: • 12 fields of 30 characters per record • Maximum sort and search capabilities on single and multiple fields • Merging of files • Global file entries • Complete flexibility of printing applications.

ListMaker includes a program diskette and an easy-to-follow User's Manual conveniently packaged in a sturdy vinyl binder.

ListMaker Suggested Retail Price: **\$97.50 each.**

ListMaker can be used with:
TRS-80 Model I (48K, Order #131014)
TRS-80 Model III (48K, Order #134140)
Apple II & II Plus (48K, Order #131014), available Nov. 1982
Atan 800 (Order #132014), available Dec. 1982
IBM PC (Order #141104), available Feb. 1983
Look for ListMaker at your software dealer. Or you can order direct by using coupon below.

SAVE! Include payment and save shipping costs.



Reader's Digest Services, Inc.
Microcomputer Software Division
Parsippany, NJ 07054

ListMaker is a trademark of The Reader's Digest Association, Inc. Reader's Digest software is fully warranted by Reader's Digest. Complete details available upon request to Reader's Digest at the address above.

Prices are FOB shipping point and subject to change without notice. Invoices are payable within 30 days. Merchandise may be returned in original unopened condition within 30 days of delivery. Contact Reader's Digest, Dept. 911, 100 West 25th St., New York, NY 10011, for return address. Program availability rates apply.

☐ YES! I'd like to save time and money with ListMaker and my micros. Please let me have the versions I have indicated.		RM 10/19/82
☐ Payment enclosed. ☐ Bill me (subject to credit approval).		
City	Name & Title	RM 10/19/82
State	Unit for sale:	
#131014	TRS-80 Model I (48K)	\$ 97.50
#134140	TRS-80 Model III (48K)	\$ 97.50
#131014	Apple II & II Plus (48K) (single 118K)	\$ 97.50
#132014	Atan 800 (single 128K)	\$ 97.50
#141104	IBM PC (single 280K)	\$ 97.50
☐ Please add my name to your mailing list for more information on software from Reader's Digest.		Total Order
Name _____		
Address _____		
City/State/Zip _____		
Company _____		
Title _____		

Reader's Digest Services, Inc., Microcomputer Software Division, Parsippany, New Jersey 07054

Microcomputers defend U.S. in office, on the battlefield

By Tom Shea, IW Staff

"I'm tired of seeing the armed services portrayed as slow, inefficient num-nuns who are behind everyone else, the way Jack Anderson makes out," says Air Force Major Frank Derfler.

The U.S. armed services are using standard, commercially available microcomputers such as Apples and Cromemcos in a big way for office and administrative work as well as on the battlefield.

Perhaps because of its historical dependence on high-technology systems, the U.S. Air Force seems to be ahead of the other services in developing clear-cut roles for the new technology. The Army, with its Apple II battlefield trials, seems to be the most experimental. And the Navy regards personal-computer uses as "unofficial" and is playing its cards close to the vest.

Derfler reels off a long list of uses the U.S. Air Force is making of microcom-

The U.S. Army's major involvement with microcomputers is a battlefield 'command and control' experiment using Apples.

puters around the world, including the widespread use of commercially available business software packages such as spreadsheet programs, word processors and data-base-management systems.

"We are in step with, or in some case ahead of, the practices we find in big industries for microcomputers," he states.

Derfler is a special assistant to the Secretary of the Air Force. He says the U.S. armed services have made good business decisions in their choices of microcomputer hardware and software by insisting on portability and standardization as much as possible.

"We made decisions based on the outlook that we're going to be expanding our capabilities to 16-bit, multitasking microcomputers," he says.

The Air Force has ambitious programs for using micros. That branch of the services is closely following the strategies used by large civilian firms for adapting to the new technology. It has established a software-validation center at Gunter Air Force Station in Montgomery, Alabama. The center acts as a consulting group and clear-house; it makes sure that new programs developed by servicemen conform to standards, so that the programs can run on any similar micro throughout the Air Force.

To the degree the microcomputer industry has standards, the Air Force has adopted them: Its systems are largely Z80-based, run the CP/M operating system and use 8-100 bus architecture.

The Tactical Air Command (TAC) in Langley, Virginia, recently agreed to purchase 1500 microcomputer systems. The bidder who won the contract is putting together Cromemco systems with printers and other peripherals; the computers will be used

by TAC groups in the U.S., Europe and the Pacific, Derfler says.

The Air Force doesn't do much programming in BASIC. The number of dialects of the language work against its use in a big organization that wants software to be portable. "We only want to develop software once," not again and again for each different micro, Derfler explains.

If they need to write their own programs, U.S. Air Force programmers generally work in FORTRAN or COBOL.

For real-time system-control applications, the Defense Department is strongly pushing its own program-

ming language, Ada. (Ada is somewhat similar to Pascal, but it is more powerful and complex.)

Although the Air Force has embraced the use of microcomputers with enthusiasm, it is being cautious about appearances: "We must avoid even the perception of duplication and waste," Derfler says.

"Let me give you an example. Suppose there's a microcomputer that's sitting at a SAC [Strategic Air Command] alert facility. The microcomputer is used legitimately for planning fuel-allocation tables.

"It can be used for that, several hours a day. But the air crews are there

24 hours a day on alert. Now, should that government-owned and -purchased microcomputer be used to play games in the evening? What's the perception of that if a visitor comes by and sees the crews playing games in the evening? What do they think?"

Derfler says the computer-games problem is significant, especially in places where crews are stuck on round-the-clock duty.

The U.S. Army's major involvement with microcomputers is a battlefield "command and control" experiment in which Apple IIs are networked together in the field to disperse a gen-

See Armed forces, page 26

NEW LOW PRICES!
 Call toll free 1-800-323-6543
 In N.Y. State call collect (718) 475-1417

The CHAT.

A price/performance leader.

Sharp 7 x 9 dot matrix characters
 Character highlighting
 Serial Auxiliary Port
 10 Program Function Keys
 Detached typewriter style keyboard
 Copy Key

15 independently selectable transmit/receive speeds
 White, green or amber display
 Switch-selectable light or dark background
 Cursor Control Keys
 14-Key Numeric Keypad

The CHAT. The NABU terminal that allows you to expand your system economically without sacrificing quality or performance.

Features include switch-selectable Volker-Craig VC404 and Lear Siegler ADM-3A compatibility, 12" non-glare screen, character highlighting, detached keyboard with 4-ft. coiled cord.

ADM-3A is a registered trademark of Lear Siegler Inc.

cursor control keys, 10 program function keys, a bi-directional serial port, and a 16-key numeric keypad... all standard!

All these features and more... and a truly economical price-tag.

Get complete information today, and discover why the CHAT is the terminal that should cost more.

The CHAT supports WordStar and is available in an economical graphics version—the CHAT/GX.

WordStar is a registered trademark of Micropro



COMMERCIAL TERMINALS
(Formerly Volker-Craig)

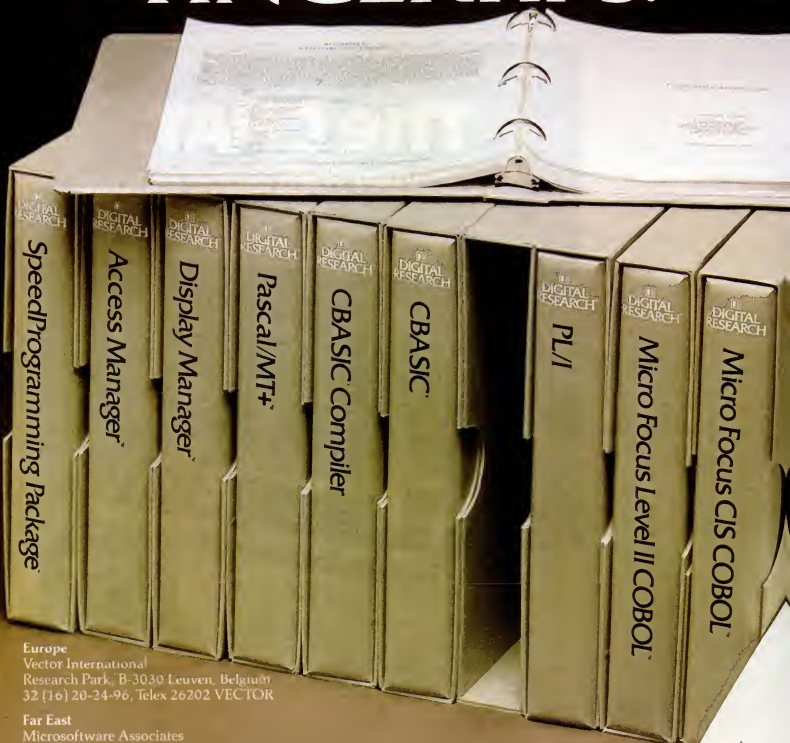
NABU MANUFACTURING CORPORATION, COMMERCIAL TERMINALS
 United States
 330 Main, Port
 Washington, New York
 14872
 (716) 475-1221

Canada and International
 330 Main, Great North
 Toronto, Ontario, Canada
 M2J 1P9 (416) 468-2500
 Telex: 555-9327
 Telex: 555-9327

United Kingdom
 Watford City, Watford, West
 Hertfordshire, England WD17 8SL
 Telex: 940037-1175
 Tel: 0494-66000
 Northern Office: 50 Furze Road, Doncaster
 Yorkshire DN1 5AB (01422) 741-4413

Distributors in Argentina, Australia, Belgium, Canada, Denmark, England, Finland, France, Germany, Greece, Hong Kong, Iceland, Israel, Italy, Japan, Korea, Mexico, The Netherlands, New Zealand, Norway, Philippines, Singapore, Spain, Sweden, Switzerland, Taiwan, U.S.A.

PRODUCTIVITY AT YOUR FINGERTIPS.



Europe
Vector International
Research Park, B-3030 Leuven, Belgium
32 (16) 20-24-96, Telex 26202 VECTOR

Far East
Microsoft Associates
6 Floor A.Y. Building, 3-2-2 Kitaaoyama
Minato-ku, Tokyo 107, Japan
03-403-2120, Telex 2426875 MSA

Tools for more powerful programming.

The creators of CP/M[®] bring you the most powerful library of languages and utilities on the market. Developed to increase programmer productivity and to produce top quality applications, our languages allow you to work efficiently with both 8 and 16-bit microcomputers. Digital Research utilities reduce coding and designing effort for speedier programming and higher productivity. Our languages and utilities comprise the finest collection of microcomputer

programming tools available anywhere.

When you're designing microcomputer software use proven Digital Research languages and utilities. You can count on the highest standards in software and support from the company that made CP/M the most accepted microcomputer operating system. For information, call or write Digital Research (408) 649-5500 or (408) 649-3896, 160 Central Avenue, Pacific Grove, California 93950.



DIGITAL RESEARCH™

The creators of CP/M™



DOD wants a 25-year lifespan for its new language

After a long gestation, Ada will speak as unifying language for all U.S. armed forces

By David Needle, IW Staff

In an effort at least as difficult as trying to find the Wizard in the land of Oz, the United States Department of Defense (DOD) has spent five years seeking a single, all-purpose, transportable, computer language.

Back in the mid-70s, the DOD began its drive to establish one standard programming language that could survive

the ongoing advances in hardware and changing applications that often required programmers to learn new languages.

After years of study and weighing various proposals, the DOD found the solution it was looking for—Ada.

Now, if all goes as planned, Ada will become the dominant computer language used in the military for at least the next 20 years.

Heretofore, each branch of the military used its own relatively exclusive development language, such as Jovial or Algol. The DOD, therefore, sought a

language that could easily be transferred from one machine to another.

Specifically, the DOD's goal was to establish a common language for all of its military computer projects. Its weapons-control systems, for example, are typically embedded with a series of microprocessors. The concept behind Ada was that it would be able to run on any of these various microprocessors. Estimates as to how much money the DOD could save by implementing a standard language ranged as high as \$100 million annually.

By 1975, the DOD began publishing

a series of "requirements documents" through its newly formed High Order Language Working Group. The documents described the DOD's common language needs.

The documents or proposals became more focused as the DOD received feedback from various firms bidding on the potentially lucrative military contract.

The general parameters of the first document, named Strawman, became more specific, if not more complex. In successive proposals named Woodenman, Tinman, Ironman and finally

Armed forces

continued from page 23

eral's command staff. Dispersing the command staff reduces the risk that a single bomb could wipe out everyone at a central command post.

Mike Laughon, a high-ranking civilian staff officer with the Army's Command Control Communications division, assists the chiefs of staff for the Army in the area of computers. Laughon calls the battlefield experiments a "bottoms-up development"—one in which you give the user the equipment and notice what means he devises naturally for using it in the field.

The experiment uses off-the-shelf Apple IIs with quick "band-aid" fixes to make them more rugged. The networked Apples let soldiers share information via computer networks. The Apples run off of electricity generated by Army field generators; line filters protect the computers from voltage spikes.

"We don't know exactly how best to use it [the microcomputer], so we're trying to use some commercial pieces of gear to see how we can use them out there," says Laughon.

Army intelligence agents use Apples for filing information, and small-computer equipment of various kinds fills what are called "combat support roles"—logistics, personnel and accounting tasks. Omninet equipment and Corvus hard disks are used extensively, according to Laughon.

Personal computers do ride the waves aboard some U.S. Navy ships. They're used for supply and logistics and in the weapons sections. "I'm not saying these are official operations," says Lee Dickey. "They are there, though."

Dickey, whose title is Special Assistant to the Assistant Secretary of the Navy for Financial Management, was a design engineer who helped design the VAX 11/78 computer when he was at Digital Equipment Corporation.

Now, he advises the Navy on technical specifications for computer purchases.

He's currently trying to convince several personal-computer manufacturers to agree on certain standards that will help the Navy with problems of hardware and software compatibility. Dickey says that the Navy uses Apples, Zilog computers and TRS-80s, among other microcomputers.

Dickey claims the government has a lot of out-of-date computer installations. He favors the new microcomputers because they are "smaller, take less electricity, take up less space and they need less maintenance."

Learn, Play, Explore

99'er T!fest
A Personal Computer Conference, Trade Show & Seminar

...EDUCATION LAND...
...COMPUTER GAMING LAND...
...99'er LAND...

Brooks Hall at Civic Center
San Francisco, Cal.
October 22-24, 1982

SOFTWARE SOFTWARE

Steelman, the last in the series.

In August 1977, the Defense Department awarded four contracts for competitive development of the new language, based on the Steelman document.

In 1978, the DOD narrowed its choice to two and by 1979 chose one design—Ada—from a French company, CII-Honeywell-Bull.

Observers closer to the scene differ on how great the impact of Ada will be on the commercial sector and even within the military itself.

"It makes a lot of sense to want a standard language, but its [DOD's] expectations are unreasonable," commented Charles Lecht, formerly the president of Advanced Computer Techniques, which does a lot of

contract-development work for the Air Force involving a language called Jovial.

Lecht feels that it's "wildly optimistic" of the DOD to expect Ada to hold up for 20 years, although he understands why the DOD hopes it does. "Its frustration in trying to obtain implementations that last is understandable, but to make a 20-year commitment in such a rapidly changing field is a mistake."

If the decision were his to make, Lecht says he would be more likely to commit to a language such as FORTRAN that already has "a continuing stream of potential practitioners" made up of people who understand high-school-level algebra.

The real threat to Ada's long-term

success, in Lecht's opinion, is English. "We should eliminate the language barrier and start to build machines that speak our language. English is waiting in the wings," declared Lecht. Such English- or natural-language-based systems are, in fact, under development.

Although Lecht concedes that there will probably be "a lot of hoopla" in military circles initially, he maintains that Ada will never gain widespread acceptance. "It'll only be used by a group of sophisticated practitioners and will never replace COBOL," according to Lecht.

Charles Moore, the inventor of Fortran, agrees in part with Lecht. In a recent interview with *InfoWorld*, Moore said that although he liked Ada,

it has "tried to be all things to all people. It's much too complex a language—especially for the less experienced programmer."

Another hurdle the "Adaniks" within the DOD haven't faced up to, according to Lecht, is the fact that military personnel tend to move around a lot. This makes it difficult for enough people to receive the proper training.

Criticism aside, the DOD effort is in full gear, and those charged with the responsibility of readying Ada look forward to its arrival.

Lieutenant Colonel Vance Mall of the Ada Joint Programming Office in Arlington, Virginia, told *InfoWorld* that the development effort is ahead of schedule and will result in systems running Ada-compiled software as early as 1984. This is despite the fact that the definitive version of Ada is still incomplete, although Mall expects it to be completed within the next few months.

"What we want is an absolute standard," commented Mall. To that end,

'The threat to Ada's long-term success is English. We should eliminate the language barrier and start to build machines that speak our language.'—C. Lecht

the Defense Department has trademarked the name Ada and will not allow anything that is not a complete version of the language to carry the name.

"There's no question that Ada is more powerful than other languages," noted Mall. "It will require some sophistication to learn, but we're trying to avoid the moving-target problem of continually having to train or recruit programmers who know new languages."

"We expect it to be stable for the next five years, when it will be reviewed by the appropriate ANSI committee," said Mall. Taking into account the periodic ANSI revisions, Mall expects Ada to be the primary language for all branches of the military for the next 20 to 25 years.

It is not uncommon that huge military expenditures in research and development engender commercial products. The commercial development of the microprocessor, for example, had its roots in the space program, which received funding from the Defense Department. In the case of Ada, several companies are helping the DOD with the project, and commercial spin-offs seem inevitable. If not widespread.

Intellimac, of Rockville, Maryland, for example, has released a multiuser Ada called Multi-System Executive (IN/MSX).

Reportedly, IN/MSX allows up to eight users to run Telesoft-Ada (another commercial product) on Intellimac's own Multibus 68000-based multiprocessor system.

Telesoft, based in San Diego, California, came out with the first commercial Ada compiler in August 1981. More recently, Telesoft developed compilers for other systems, including the IBM Personal Computer.

See Ada, page 28

& Experience

99'er Presents **TI Fest**

The Award-Winning Publication for the Texas Instruments Line of Personal & Home Computers **COMES ALIVE**...

Come See the First Living Magazine™

(A Human-Engineered Floor Layout, Decor, & Seminar/Demonstration Schedule Guiding Each Attendee Through Flexible and Self-Paced Learning, Enrichment, and Entertainment Activities.)

Time	Room #1	Room #2	Room #3
9:30 - 10:45	Engineering Program with TI BASIC (Part 1)	Application Program with the 9900A System (Part 1)	Small Business Bookkeeping & Accounting Systems
11:00 - 12:15	Beginning Programming with TI BASIC (Part 2)	Assembly Language on the 9900A System (Part 2)	Applications for Hand Held Computing Systems
1:30 - 2:45	Introduction to TI LOGO (Part 1)	Introduction to TI FORTH (Part 1)	The 9900A System
3:00 - 4:15	Introduction to TI LOGO (Part 2)	Introduction to TI FORTH (Part 2)	Small Business Bookkeeping & Accounting Systems
4:30 - 5:45	LIJ Software for Home Education	Scientific & Engineering Applications for Personal Computers	Third Party Software Development
9:30 - 10:45	Assembly Language on the 9900A System (Part 1)	Electronic Mail with the Home Computer	Advanced Course Software for School Management
11:00 - 12:15	Assembly Language on the 9900A System (Part 2)	Using the Data Index Information Service with the Home Computer	Third Party Software Development
3:00 - 4:15	Beginning Programming with TI BASIC (Part 1)	Financial Management with the Home Computer	Third Party Software Development
4:30 - 5:45	Beginning Programming with TI BASIC (Part 2)	The Design of Acoustic Wave Devices	The 9900A System
12:00 - 1:15	Introduction to TI LOGO (Part 1)	Introduction to TI LOGO (Part 2)	Small Business Bookkeeping & Accounting Systems
1:30 - 2:45	Introduction to TI LOGO (Part 2)	Introduction to TI FORTH (Part 1)	Small Business Bookkeeping & Accounting Systems
3:00 - 4:15	Introduction to TI LOGO (Part 2)	Introduction to TI FORTH (Part 2)	Small Business Bookkeeping & Accounting Systems
4:30 - 5:45	Introduction to TI LOGO (Part 2)	Introduction to TI FORTH (Part 2)	Small Business Bookkeeping & Accounting Systems
5:00 - 6:00	Introduction to TI LOGO (Part 2)	Introduction to TI FORTH (Part 2)	Small Business Bookkeeping & Accounting Systems

Brooks Hall at Civic Center
San Francisco

Friday Oct. 22, 1982
(9:00 AM - 6:00 PM)

Saturday Oct. 23, 1982
(9:00 AM - 6:00 PM)

Sunday Oct. 24, 1982
(10:00 AM - 5:00 PM)

Pre-Registration Information

1-Day Attendance Ticket \$7.00

2-Day Attendance Ticket \$10.00

3-Day Attendance Ticket \$12.00

Special Week-End (Sat. & Sun.)

"Vid-Kid" Pass \$7.00

(must be under 12 years of age)

PRE-SHOW & POST-SHOW

MULTI-DAY WORKSHOPS

*TMS9900 Assembly Language

*TI LOGO

*UCSD Pascal

Call for times, locations, & fees.

(503) 485-8796

WEST COAST TIME

- SEE & OPERATE the latest personal computer hardware & software, electronic learning aids, and hand-held programmables from TI and third-party vendors.
- PLAY spectacular Home Computer arcade games, and enter the competition to win computers, peripherals, and software.
- SAVE MONEY by purchasing all the products you need at special show discounts.
- LEARN HOW TO PROFIT by producing software and hardware for this dynamic new mass market—hundreds of thousands of new users who can't resist a \$200 16-bit color computer with speech synthesis capability.
- WHEEL & DEAL directly with manufacturers, dealers & product developers who are displaying & selling to thousands of eager buyers.
- MEET with user's groups and share ideas with others of similar interest.

★ HUNDREDS OF DOOR PRIZES to be given away!

99'er Magazine • 1500 Valley River Drive, Suite 250 • Eugene, OR 97401 • Tel. (503) 485-8796

A service mark of Emerald Valley Publishing Co.

Copyright © 1982 by Emerald Valley Publishing Co.

WE WILL NOT BE UNDERSOLD

RANA ELITE ONE APPLE DRIVE CALL



TERMINALS

ADDS Viewpoint	\$475.00
Zentix Z-18	\$550.00
Teravideo 810	\$595.00
Teravideo 825	\$770.00
Teravideo 950	\$960.00

RAM

16K Ram Kit for Apple II, TRS80	\$17.50
200 nano access, 4119 chips	

DISKETTES

Musell 5 1/4" single side	\$30.00
Musell 5 1/4" single side	\$49.00
Musell 5 1/4" double side	\$45.00
Musell 5 1/4" double side	\$55.00
BASF 5 1/4"	\$25.95
BASF 5 1/4"	\$30.00
Verbatim 5 1/4"	\$23.95
Verbatim 5 1/4"	\$30.00
Wabash 5 1/4"	\$21.95

TELECOMMUNICATIONS

Prentiss Star Modem	\$129.00
Novation Cat Modem	\$139.00
Novation D-CAT	\$149.00
Novation AUTO-CAT	\$199.00
Novation APPLE CAT	\$299.00
Hayes Smart Modem	\$249.00
Hayes Smart Modem 1200	CALL
Hayes Micro-Modem	\$299.00
Hayes Chromograph	\$225.00
Signamax I	\$65.00

COMPUTERS

Sanyo MBC 1000 64K	CALL
Call for information on the complete Sanyo line.	
CALIFORNIA COMPUTER SYSTEM	
Mainframe 2000a	\$485.00
Z-80 CPU 28010a	\$295.00
64K RAM 2065	\$569.00
Floppy Controller 2422a	\$359.00
Z8016	CALL
Z-88 48K	CALL
Z-8016	CALL
Z-100	CALL
Call for Prices On The Complete Zenith Line	
Case 74702P Pocket Computer	\$179.00

SOFTWARE

MICROPRO	
Wordstar	\$239.00
MultiMerge	\$99.00
Customization Notes	\$89.00
Spellstar	\$239.00
Defstar	\$199.00
Calculator	\$199.00
MICROSOFT	
Basic Interpreter	\$349.00
Basic Compiler	\$399.00
Fortran 80	\$695.00
Code 60	\$695.00
DATA BASE	
FRASID	\$595.00
FRASID	\$599.00

For fast delivery, send certified checks, money orders, or call to arrange direct bank wire transfers. Personal or company checks require one to three weeks to clear. All prices are in order only and are subject to change without notice. Call for shipping charges.

APPLE ACCESSORIES

Z-80 Card by Microsoft	\$319.00
16K Card by Microsoft	\$159.00
32K Card by Saturn	\$199.00
Keyboard Enhancer II by Video	\$125.00
Videoterm by Video	\$250.00
Game Pads by TG	\$48.00
Joystick by TG	\$49.00
Numeric Keypad by Keyboard Co.	\$139.00
ALP 9 Voice Board	\$159.00
ALP 3 Voice Board	\$229.00
System Server by Kensington	\$175.00
Versacard by Promethea	\$229.00
Microbuffer II 16K w/graphics	\$299.00
Microbuffer II 32K w/graphics	\$299.00
APPLE INTERFACE CARDS BY CCS	
Serial Approach #7710	\$139.00
Centronics #7720	\$149.00
ADVANCE LOGIC	
Add-Ram 16K Card	\$99.00
Z-Card CPM for the Apple II	\$225.00
Smartest 80 Column Board w/Softswitch	\$249.00

CORVUS HARD DISC 20 mg with mirror \$5389



APPLE SOFTWARE

MICROPRO	
Wordstar	\$199.00
MultiMerge	\$99.00
Spellstar	\$149.00
Defstar	\$199.00
Calculator	\$199.00
VERICORP	
Electron 13"	\$199.00
ViewCalc	\$79.00
ViewTerm	\$199.00
ViewDraw	\$199.00
ViewPlot	\$199.00
ViewFile	\$199.00
ViewSchedule	\$299.00
ViewTrend/Plot	\$299.00
MISCELLANEOUS	
Micro Counter	\$219.00
Screenwriter II	\$129.00
Executive Briefing System	\$169.00
Supercalc	\$199.00
Personal Filing System	\$115.00
PTB Report Writer	\$75.00
ENTERTAINMENT	
Word Handler	\$27.00
Beer Run	\$26.00
Epoch	\$32.00
Mighty Magic	\$32.00
Wizardry	\$44.00
Jeopardy	\$20.00
Tuesday Morning Quarterback	\$24.95
Crash, Combos, & Chomp	\$24.95
Deletions of Rym	\$15.95
Morloc's Tower	\$15.95
Snack Attack	\$23.95
Star Blazer	\$24.95

SANYO MBC 1000 64K COMPUTER CALL



IDS MICROPRISM 110 CFS NEW



PRINTERS

NEC 7710 Serial	\$2395.00
NEC 7720 KSR	\$2749.00
NEC 7730 Parallel	\$2395.00
NEC 3510 Serial	\$1850.00
NEC 3520	\$2099.00
NEC 3530 Parallel	\$1850.00
NEC 8023 Dot Matrix 100 cps	\$529.00
SECS D7211 Letter Quality	
Daisy Wheel Printer	\$1095.00
Parallel Only	\$695.00
Epson MX-80	CALL
Epson MX-80FT	CALL
Epson MX-100	CALL
IDS Micro Prism	CALL
IDS Prism 80	CALL
IDS Prism 132	CALL
Okidata Microline 80	CALL
Okidata Microline 82A	CALL
Okidata Microline 83A	CALL
Okidata Microline 84	CALL
Datadisc 180 cps	CALL

MONITORS

Andek 13" Color	\$329.00
Sanyo 9" B & W	\$135.00
Sanyo 9" Green	\$140.00
Sanyo 12" B & W	\$179.00
Sanyo 12" Green	\$199.00
Sanyo 13" Color	\$359.00
Zentrix 12" Green	\$105.00
Zentrix 13" Color	\$339.00
Color Monitor	
Electrohome 13" Color	\$629.00
Electrohome 13" Color	\$349.00
Electrohome 12" B & W	\$179.00
Electrohome 12" Green	\$199.00
Electrohome 9" B & W	\$149.00
Electrohome 9" Green	\$159.00

DISK DRIVES

CGI 100 for the TRS-80 Model 1	\$299.00
5 1/4" disk track	
CGI 189 for the Zenith Z-99	\$379.00
5 1/4" disk track	\$399.00
CORVUS 5M with Mirror	\$449.00
CORVUS 20M with Mirror	\$539.00
CORVUS Interface	CALL
RAMA SYSTEMS add-on Disk Drive for the Apple II	
Elite One 40 Track	CALL
Elite Controller	CALL

IBM PC ACCESSORIES

64K Card by Microsoft	\$435.00
Joystick by TG	\$49.00
128K Card	\$579.00
162K Card	\$679.00
256K Card	\$699.00
256K Combo by AST	\$1099.00
Combo Card by Apparat	\$249.00
Call for more IBM PC add-ons	

NEW: IBM PC SOFTWARE NEW!

INFORMATION UNLIMITED	
Easy Writer	\$299.00
Easy Speller	\$149.00
Easy Filter	\$319.00
VERICORP	
Visicalc 64K	\$159.00
Visicalc 256K	\$199.00
MICROPRO	
Wordstar	\$299.00
MISCELLANEOUS	
Supercalc by Sorcim	\$229.00
Superwriter by Sorcim	\$299.00
Time Accounting Plus	\$159.00
ENTERTAINMENT	
Deadline	\$39.00
Temple of Apath	\$20.00
Curve of R	\$15.95
Call for More IBM Software And Accessories.	

Ada

continued from preceding page

"There's not a great demand for it now on the PC, but the Ada world is just starting," said Peter Dine, president of Telesoft.

"We have a computer-aided instruction program to teach Ada, for example, the engineer in the street who has a PC and wants to get going on Ada."

SuperSoft, in Champaign, Illinois, recently announced a C/P/M version of Ada for the Z80 and also for the 8086 and 8088 microprocessors.

Another company, SoftTech (under contract with the DOD), has developed some 1600 tests for would-be Ada compilers.

SoftTech is also working on a 68000-based microcomputer system that would tie into a larger VAX minicomputer. "We plan to download Ada software from the VAX down to the micro," explained Richard Thall of SoftTech. "Ada produces more reliable programs."

Fifteen years ago, the military influenced approximately 75% of the products reaching the commercial data-processing community, according to Colonel James Ralph of DOD's Computer System Command division. Today, Ralph estimates that influence has plummeted to 10%-15%.

The Computer System division is primarily involved in business-oriented/information-management applications, such as routing supplies and handling personnel records. According to Ralph, "99.9% of those applications are written in COBOL. Ralph views Ada as neither an immediate nor a necessary savior for the tasks he has to perform."

"Our problems are more akin to the business world (than embedded-weapons systems)," added Ralph. "COBOL solves the kinds of things we do." Because of the massive commitment to Ada, however, Ralph's division is including Ada in future procurement plans.

If it were simply a matter of preference, Ralph, who has a Radio Shack TRS-80 computer for his personal use, commented "I prefer BASIC."

Ada's family

Ada was named in honor of Augusta Ada Byron, Countess of Lovelace and daughter of Lord Byron. Ada is considered by many to have been the world's first programmer.

Ada assisted Charles Babbage, who is known for his design of two mechanical calculating devices called the difference engine and the analytical engine, back in the 1840s. Although Babbage never actually finished work on either device, the concepts behind them include many of the features used in today's digital computers.

The Analytical Engine was patterned after the Jacquard loom, which handled data on punched cards. Lady Ada hypothesized that a large calculation containing many repetitions of the same sequence of instructions could be placed on a single set of cards for recurring instructions. The processes she had described are known to us today as "loops" and as "subroutines." —DN

The CPU Shop

TO ORDER CALL TOLL FREE 1-800-343-6522

420-438 Rutherford Ave., Dept. IF10/82Cherlston, Massachusetts 02129

Hours: 9 AM - 9 PM (EST) Mon-Fri (Sat till 6)
Technical information call 617/242-3361

TWX- 710-348-1796

Massachusetts residents call 617/242-3361
Massachusetts Residents add 5% Sales Tax



Defense Language Institute deploys micros, video technology

By Scott Mace, IW Staff

War isn't just fought on the battlefield. Intelligence—be it espionage, monitoring or just assisting allies—is undertaken by many branches of the military as well as by the CIA and the National Security Agency.

For that reason, the U.S. armed forces have put together perhaps the finest facility for learning foreign languages anywhere in the world. It's the Defense Language Institute, nestled in the tree-covered Presidio of Monterey, California, as well as at campuses in Texas and San Francisco.

At any time, more than 2000 students are at DLI learning 39 languages. Students come from all branches of the armed forces, plus from other federal agencies where a second language is necessary, such as the FBI, Customs or the Immigration and Nat-



Technology aids language learning.

uralization Service. In addition, exceptional students from nearby California public universities and dependents of military personnel can take courses.

The courses are intensive and take from 27 to 42 weeks. Students must attend class six hours each day, and spend two to three hours on homework each night.

According to Major Allen Rowe, DLI's chief of educational technology, "There are certain activities in a foreign-language teaching and learning process that are essentially repetitive." These include drill and practice on verb conjugations, noun declensions and vocabulary reinforcement. Rowe said these tasks "can be handled well by a machine."

By using videotape—and soon videodiscs, some tied to personal computers—foreign-language instructors can teach more “inventive and creative things” and communicate with students in less formal ways, Rowe explained.

That might not be the only benefit. Preliminary studies by Wicat under a National Science Foundation study showed that using videodisc technology to teach biology was between 30% and 40% quicker and improved test scores 20%.

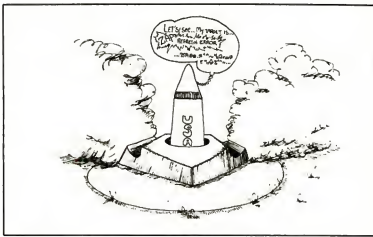
Right now, DLI has more than 75 study carrels with videotape players. The nearly 1000 tape titles in DLI's video-learning center include news broadcasts, television entertainment, movies, documentaries and cultural events in languages from around the world. According to the center's education specialist, James Sindberg, the

lab is "not a specific part" of the students' instruction in general, though some departments schedule time for classes there. Between classes, though, students use the center frequently.

Rowe is now extending the role of video, planning to enable it to react to student input and branch to different lessons, based on student decisions. This experimental program involves a videodisc player plus a personal computer. (See *InfoWorld*, September 6.)

DLI, along with Utah State Univer-

See DLI, page 30



Super Sale!

40% Off On Ohio Scientific Superboard II A Complete Computer System On A Board

Includes full-size 53-key keyboard, video and audio cassette interfaces; SWAP, Modem, sampler cassettes; manual; 8K BASIC-in-ROM, with 8K RAM. Requires 5-V/3 amp regulated DC power supply. 30-day limited warranty. Supply is limited. **ONLY \$200.00**



Cleveland Consumer Computers & Components
1333 S. Chillicothe Road, Aurora, OH 44202
TO ORDER: CALL 1-800-321-5805 TOLL FREE
(Ohio Residents Call 216-562-4136)

- ☐ SUPERBOARD II, \$200.00

Name _____

Address _____

City _____ State _____ Zip _____

Payment by enclosed check or money order or charge to:

☐ MasterCard ☐ VISA

Account # _____ Expiration Date _____

Total Amount Charged or Enclosed \$_____

Ohio Residents Add 5.5% Sales Tax. All Orders Will Be Shipped Insured By UPS Unless Requested Otherwise.

Introducing the dBASE II® HELPLINE

The new dBASE II HELPLINE is designed to put dBASE II and QUICKCODE Users in contact with their fellow users. This new national network will enable dBASE II users to:

- Offer and receive advice and consultation on dBASE II programming
- Exchange and standardize specific applications
- Exchange information on bug reports.
- Create cooperation on application developments
- **AND MUCH MORE!**

HERE'S HOW SIMPLY IT WORKS:

Send us your name, address, telephone and length of time using dBASE II. We will collate, using dBASE II, of course, and make available to you a listing of other users in your region at no charge. Then it's up to you to contact them for advice, information or just to exchange ideas.

To become a member, please send the above information to:

**DIRECTOR OF PRODUCT DEVELOPMENT
STANDARD SOFTWARE CORPORATION
DEPARTMENT A20
10 MAZZEO DRIVE
RANDOLPH, MA 02368**

This is a free service brought to you by Standard Software Corporation in cooperation with four of the founding members of the Boston dBASE II Users Group (established 9/81).

David Britton Dwayne Baye Joseph Gannon Glenn Meader

dBASE II IS A TRADEMARK OF ASHTON-TATE

Micros make inroads at the Pentagon

By Scott Mace, IW Staff

"We're trying to rethink how we do things" might be a quote from any large corporation these days. The days of massive computer systems being king of the hill are numbered. Large computers are challenged by the onslaught of small, portable, personal or desktop computers.

If you wanted to, you could think of the Pentagon as one of the largest corporations around, with hundreds of billions of dollars in its budget. Trying to decide what policies will govern the use of personal computers in the military is a job that falls on many shoulders, but especially on those of

William Leary, the deputy director for information resources management systems, who works at the Office of the Assistant Secretary of Defense at the Pentagon.

Certainly, small computers are being installed and used already in various parts of the military, for weaponry as well as more peaceful applications (see related articles). But a unified policy concerning microcomputers, according to Leary, would allow the Defense Department to save money by making discount purchases and, more importantly, would establish software, hardware and communications standards to avoid thousands of different

standards.

Understandably, the Pentagon is looking at all manufacturers, and some manufacturers are courting the Pentagon.

Right now, Leary's office is surveying all branches of the military to see who is using small computers and for what. Three studies have already been completed, covering industry trends, new technologies and different application areas.

The Defense Department is also looking at small-computer uses in 10 of the top 50 U.S. companies, as rated by *Fortune* magazine, Leary said.

See Pentagon, page 31

DLI

continued from preceding page
 and Brigham Young University, have put together their first interactive-video lesson, based on a German educational television tape, "Klavier im Haus."

The lesson, to be used internally at DLI, was displayed at DLI's third FLINT (Foreign Language Instructional Technology) Conference in September. Foreign-language educators from around the country attended the four-day conference.

FLINT was cosponsored by the Goethe Institute, a nonprofit organization based in Germany that has 116 institutes in 65 countries. Goethe Institute's deputy director, Karl-Peter Grune, said the institute's main thrust is the propagation of cultural exchange and German-language study around the world.

The Goethe Institute and DLI hope to produce 20 to 30 German videocassettes in the next year.

The key to using the videocassette in foreign-language lessons is the ability to address any one of 54,000 video still frames in 2.5 seconds or less. Each frame corresponds to a particular number, allowing either the student (under manual control) or the computer (under software control) to move to another part of the 30-minute disk.

"The concept has already been validated in language training at Brigham Young University," Rowe said.

One application would locate a series of questions at one point on the disk, and place the answers several thousand frames away. Through a menu, the student could, if allowed, reach the answer quickly.

Overwhelmed by the talent

Utah State University's Michael DeBlois was one of the FLINT presenters. "Language teaching and technology have not been bedfellows very long," he said. "Yet I've been overwhelmed by the talent that's been here."

"I guess the potential is what struck me more than anything. The conference has made me more aware of the opportunity that confronts us in language instruction."

Rowe added that he hopes to incorporate game-playing technology, including real-time decision-making by the student, who would have to figure out what was being said and respond correctly. One presentation at FLINT, from Ruth Sanders of Miami University in Ohio, described a computer-adventure game called SPION. Players have 300 *Deutsche Mark*s and must travel to various places around a city using the German language.

DLI also has about 25 Texas Instruments translators, called Language Tutors, on loan from the Air Force Academy in Colorado Springs, Colorado. These hand-held translators can display hundreds of foreign expressions, using modules for each language. Students can even hear many of the expressions, with the translators' speech synthesis.

Although true speech synthesis and voice recognition are some years away, computers are having an impact on foreign-language instruction, especially at the Defense Language Institute.



GEMINI— FOR PRINTER VALUE THAT'S OUT OF THIS WORLD

Over thirty years of down-to-earth experience as a precision parts manufacturer has enabled Star to produce the Gemini series of dot matrix printers—a stellar combination of printer quality, flexibility, and reliability. And for a list price of nearly 25% less than the best selling competitor.

The Gemini 10 has a 10" carriage and the Gemini 15 a 15½" carriage. Plus, the Gemini 15 has the added capability of a bottom paper feed. In both models, Gemini quality means a print speed of 100 cps, high-resolution bit image and block graphics, and extra fast forms feed.

Gemini's flexibility is embodied in its diverse specialized printing capabilities such as super/sub script, underlining, backspacing, double strike mode and emphasized print mode. An other extraordinary standard

feature is a 4k buffer (with an additional 4k on the serial board). That's twice the memory of leading, comparable printers. And Gemini is compatible with most software packages that support the leading printers.

Gemini reliability is more than just a promise. It's as concrete as a 180 day warranty (90 days for ribbon and print head), a mean time between failure rate of 5 million lines, a print head life of more than 1 million characters, and a 100% duty cycle that allows the Gemini to print continuously.

Plus, prompt, nationwide service is readily available.

So if you're looking for an incredibly high-quality, low-cost printer that's out of this world, look to the manufacturer with its feet on the ground—Star and the Gemini 10, Gemini 15 dot matrix printers.



star
MICROELECTRONICS

MAKING A NAME FOR OURSELVES

1120 Empire Central Place, Suite 216, Dallas, TX 75247
 For more information, please call Bob Hazzard, Vice President, at (214) 631-8560.
 See us at COMDEX Booth 3065

Rolm's rigors: Is this any way to treat a computer?

By Tom Shea, IW Staff

Because the military is hard on computers, Rolm Corporation of Santa Clara, California, puts each of its "ruggedized" military-specification computers through tortures.

After each computer is assembled and tested, technicians freeze it, bake it, vibrate it, drop it and then set it in a frame and hit the frame with a 400-pound hammer. During all this, the computer is hooked to monitoring equipment that runs diagnostic tests. If the unit fails any of the severe-environment tests, it goes back for repair.

Rolm manufactures "mil-spec" (mil-

itary specification) versions of Data

General minicomputers, as well as a smaller 16-bit unit, the Rolm 1650. The Rolm 1650 processor looks like a big black shoebox with fins and connector sockets. Controlling the launch of cruise missiles is one of its applications.

Rolm's largest machine, the MSE/800, is a compact, rugged version of the Data General Eclipse MV/8000. Weighing 610 pounds, the 3-foot-10-inch tall computer can fit through the hatch of a ship.

Technicians freeze it, bake it, vibrate it, drop it and hit the frame with a 400-pound hammer.

Although the computers in Rolm's product line vary widely in capability, they are all designed for real-time data-acquisition tasks and command

and control applications.

According to Rolm, one of its computers performs data analysis just before the Space Shuttle separates from the 747 mother ship during its cross-country piggyback rides. Most applications for the machines, however, are in Army and Navy electronic warfare systems and Air Force fighter planes. Rolm computers are the brains of some of the most sophisticated weapons systems in the U.S. arsenal.

Pentagon

continued from preceding page

Leary predicted that the military would probably lean toward broad-band communication systems to link computers, rather than a lower-cost local-area network system.

These planned military-communications standards must encompass all computers, not just the small ones, Leary noted. He said the Defense Department last year spent \$5 billion on communications programs for data systems, so a lot is at stake.

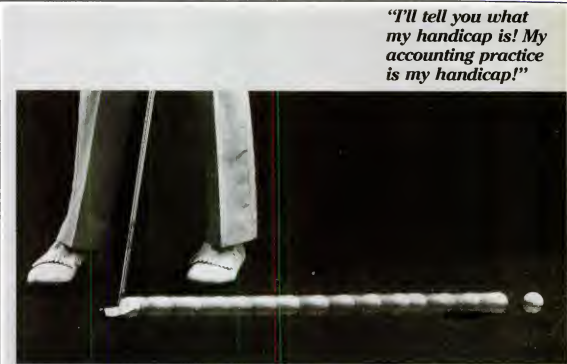
"The small computer has accelerated our need to decide how to handle local-area communications," Leary said.

Leary noted that the military "already has the new technology in a lot of areas. We have to live it."

Still, the Pentagon is cautiously deciding how to go forward, a situation Leary said many other large corporations are in right now. "We want the [microcomputer] industry to be more mature," he said.

"We have to try to understand how to use the tools we have today," Leary said. "By the time we do that, there will be a whole new generation of tools available."

Today's microcomputers are not rugged enough to be used in combat, and Leary sees "a tremendous opportunity" for small-computer makers in that area.



We hear you.

We're AML Accountants Microsystems. We've developed a complete family of accountants software for today's powerful new generation of low cost microcomputers. Software that's affordable, flexible and easy to use. Designed to streamline your practice and increase client services. That means more revenues for you. And more time to practice your golf game!

With AML, you'll never have to tell a client your computer can't do it.

Because it's the most comprehensive accountants software available. Our flexible DATAWRITE® Client Write-up System lets you define client accounts, divisional structures, data input screens, journal formats, and a lot more.

Our powerful report writer lets you custom design financial statements to suit your customer's needs. Everything from simple balance sheets and income statements to trend analyses and comparatives with net change and percentage differences.

Simply put, if you input a transaction into the system, you can put that figure on any type of report desired.

Minicomputer performance at a micro-computer price.



Couple that with additional AML programs such as: time and billing, post-facto payroll, depreciation, amortization, word processing, financial planning, tax planning and preparation, and general accounting — and

you'll be processing client information faster and more efficiently than ever before.

From AML. The nation's leading developer and distributor of quality accountants' software.

Software that operates on over 40 of today's popular CP/M microcomputers. You can count on AML for complete training. With over 70 dealers throughout the U.S., and regional offices for support when you need it.

So, if you're serious about lowering your handicap, write or give us a call. It's all in the follow-through, you know.)

"I'll tell you what my handicap is! My accounting practice is my handicap!"

Of course I want to lower my handicap!

☐ Send more info. ☐ Call me:

Name _____

Firm _____

Address _____

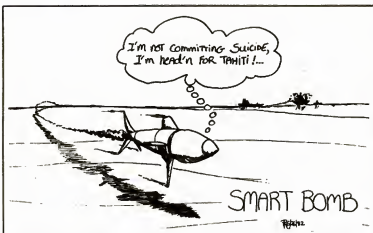
City _____ State _____ Zip _____

AML ACCOUNTANTS MICROSYSTEMS INC.

Call Toll Free: 1 (800) 426-8201
In Washington call: 206/643-2050
1404 140th Place N.E. Bellevue, WA 98007

AML. Keeping you in the black and on the green.

© 1982 AML Corporate Headquarters: 1404 140th Pl. N.E. Bellevue, WA 98007



Responsible computer pros alert public to nuclear war threat

By Tom Shea, IW Staff

"We are facing the destruction of every living thing on earth," said one middle-aged programmer. "Life on earth is at stake."

The setting was a church auditorium in Palo Alto, California. More than 60 professionals working in the computer industry sat in a circle on folding chairs to discuss how programmers and computer scientists could use their positions in the computer industry to persuade the world to get rid of nuclear weapons.

Computer Professionals for Social Responsibility is, in its words, "an alliance of computer professionals who are concerned about the growing potential for a catastrophic nuclear war." The group is a local phenomenon in Silicon Valley; it is not part of a nationwide organization.

CPSR's meetings are characterized by the kind of wrangling and soul searching typical of the early stages of other social-action groups. Its membership is growing, however, and it is making contact with other nuclear-disarmament organizations such as Physicians for Social Responsibility.

Because many computer scientists work in defense-related industries, the

'We deplore the squandering of our knowledge and skills in the pursuit of military power.'

existence of a nuclear-disarmament lobby among the people who make up the data-processing community may signal a shift in public attitudes on the issue.

"We're concerned with this issue, and we want to get other people concerned too so they'll take it into account when they vote," explains Severo Ornstein, manager of computer engineering in the computer-science division of Xerox PARC.

Ornstein is one of the four or five people—mostly from the Xerox PARC research facility—who founded CPSR. Some computerists at Xerox have been using local-area networks to communicate with each other about the growing danger of nuclear war, he said. Out of their shared concern a few people began to meet; after half a dozen meetings, the number of people attending the meetings has grown.

The group is not unanimously anti-Soviet. **See No nukes, page 33**

KEY MICRO

offers you

The Best of Both Worlds

MP/M 8-16

CompuPro's Proprietary Implementation of MP/M 86. MP/M 8-16 is a Multi-User operating system that allows you to run 8 and 16 bit software at the same time.

Hardware & Software Available for Immediate Delivery.

Software Products from KEY

RM/COBOL

Anal 74 Cobol for CP/M

COGEN

R/M Cobol

Program Generator

Demo Disk Available

EASYKEY

Wordstar Made Easy for Televideo 950 & 800 series.

Your Authorized

CompuPro
SYSTEMS CENTER



MICRO SYSTEMS INC.

976 Tropic Avenue, Centerville, RI 02816
(401) 826-1270

And Now in the Boston area

822 Boylston Street, Suite 201
Chestnut Hill, MA 02167
(617) 738-7305

MP/M & MP/M 86 are trademarks of Digital Research
CompuPro is a trademark of Goodsoft Electronics
R/M COBOL is a trademark of Ryan-McClelland Corp.
COGEN is a trademark of Spill
Wordstar is a trademark of Micropro International
Televideo is a trademark of Televideo Systems Inc.

WOW!

TP-1 Letter Quality Daisy Wheel Printer

SMITH-CORONA \$595
64K or 256K + RS232 + Flash Disk for IBM PC

SEATTLE BOARD \$299/\$499
64K or 256K Quadboard + RAM Disk for IBM PC (64K Micro Fazer \$219)

QUADRAM \$445/\$675
New! Smartmodem 1200 (Smartmodem 300 \$219) (Micromodem II \$279)

HAYES \$575
MX-80T Type III w/graphics \$425
MX-80FIT Type III w/graphics \$529
MX-100 Type III w/graphics \$669

EPSON
7710/7730 Spinwriter (55CPS) \$2285
3510/3530 Spinwriter (33CPS) \$1669
12" Green Screen Monitor \$169

NEC
Microline 82A \$439
Microline 84 \$1025

OKIDATA
TM 100-2 \$270 TM 848-1 \$380
TM 100-4 \$385 TM 848-2 \$495

TANDON
12" Green Phosphor \$159
13" Color II RGB \$699

AMDEK
64K RAM CHIPS Hitachi, Fujitsu, NEC, etc.
8-25 \$7.95 ea./ 26-49 \$7.50 ea./ 50-99 \$7.25 ea.
100-199 \$6.95 ea./ 200-499 \$6.50 ea./ 500+ CALL

MICRO PRO

CP/M CP/M

Wordstar	\$269	\$210
MailMerge	\$ 89	\$ 75
SpellStar	\$139	\$115
DataStar	\$195	\$169
SuperSort	\$149	\$119
CalcStar	\$169	\$119

VISICORP

Visicalc	\$185
Visitrend/Plot	\$225
Visipak	\$499

SORCIM

Supercalc	\$199
-----------	-------

ASHTON-TATE

dBase II \$479

Fast Delivery! From Atlanta Warehouses!
CALL COLLECT TO ORDER! 404-449-8149

MICRO MART, INC.

6898 Peachtree Industrial Blvd., #K
Norcross, GA 30071

Rolm

continued from preceding page
train customers in the use of its systems and supports the operating systems, but developing applications programs for specific uses is left to the military.

This arrangement gives the firm more freedom from control by the armed forces, and keeps it out of an area that would prove to be a huge and impossible collection of software-development tasks, according to Stanger.

Rolm may be rough on computers, but it's easy on its employees. The Rolm facilities on Old Glory Road have a country-club feeling, tree-shaded walkways connect buildings; wooden bridges span man-made ponds stocked with colorful fish.

Employee amenities include a swimming pool, sauna and jacuzzi, sports area and complete weight-training facilities. "It's a very people-oriented company," Stanger said. ■

High-speed, low-power RAM chips targeted for military use

Integrated Device Technology has just shipped its first production batch of its CMOS low-power 16K x 1-bit static RAM memory chips.

The Santa Clara, California, firm claims the integrated-circuit memory chips are the fastest 16K RAM chips with the lowest power consumption anywhere.

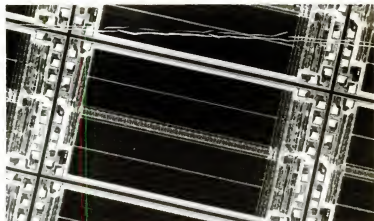
The new company is aiming its product at the military market, which needs the CMOS characteristics of low-power requirements and virtual immunity to electromagnetic noise. CMOS (complementary metal-oxide-semiconductor) technology is more expensive than the usual NMOS in-

channel metal-oxide-silicon) chips found in most computer applications.

The firm decided to specialize in the high-speed, low-power chips rather than "slug it out with the Japanese chip makers."

The IDT167 is, according to the manufacturer, "ideally suited for use in a broad range of military applications such as high-speed digital integrators for sonar and radar, airborne data acquisition and other signal processor systems."

The price ranges from \$21 to \$42 each in quantities of 100.



RAM chip from IDT combines NMOS speed with CMOS power savings.

No nukes

continued from preceding page
military, but it is unanimously against nuclear weapons. There is wide agreement that the threat of nuclear destruction overshadows all other concerns.

Guest speakers from the Stanford University faculty and from the Physicians for Social Responsibility offered advice and guidance at a recent

Programmers could document near-miss failures that have nearly triggered nuclear war.

meeting—not all of it was accepted.

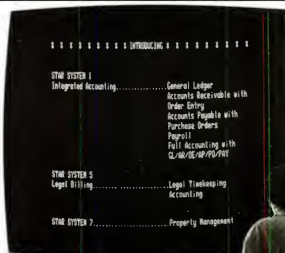
Bella Mody from the Institute for Communication Research at Stanford offered some insights into effective use of the media.

Martin Carnoy, chairman of the International Development Department at Stanford, suggested the group needed to consider wider economic and social ills that fueled the arms race, not just the nuclear issue. Ornstein and others countered that other causes would only dilute the group's power.

Barbara Paul, treasurer of a local chapter of Physicians for Social Responsibility, counseled the programmers to "find a very simple, compelling ideas" to communicate. She suggested the programmers could document near-miss failures that have nearly triggered nuclear war. She said they could speak with authority and experience about the fallibility of the computerized nuclear-weapon systems that threaten all life on earth.

Ornstein admitted the possibility that computer failures might cause a war, but said, "While it's possible, that's not what scares me. I'm much more concerned about the progress of politics in the world" and the possibility that human, political misjudgments could bring on disaster.

Toward the end of the meeting, the group agreed on a "virtually final draft" of a statement of its aims. The statement reads, in part, "We deplore the squandering of our knowledge and skills in the pursuit of greater military power that, we believe, contributes not to our security but to our common peril."



Now Showing STAR'S FREE SOFTWARE Like Your Screen Test Or Your Money Back

CP/M*, MP/M* and PC DOS** business applications software. They're all designed to run on microcomputers.

But screen test Star Software* free for 30 days and preview dependable, quality programs that do even more for 25-50% less. When you install and use them, you'll see how smooth and easy your computer helps run a business. Load in any of Star's business packages and you'll find screen prompts to guide you all the way.

It's foolproof.

Whether you take Star's interactive accounting or legal or property packages, you can't help but notice how easy it is to get started.

Part of the reason is superb documentation. Instead of groping through support materials, like most other packages, Star produces references a businessperson understands. And because Star's software runs on the smallest to the largest computers, you get uncommon flexibility.

Many of the problems seen with other software companies don't exist with Star. It's the company that proves software packages don't have to be expensive, time consuming, hard to install or hard to use. Tall claims? Maybe. But talk to a Star owner. Better yet, screen test them yourself. After all, the only way to really judge software is to use it.



Individual accounting packages are priced at \$400. Integrated Full Accounting at \$1250. Legal Timekeeping and Accounting \$950. Property Management \$950.

Send us a check, we'll send you a full evaluation copy for any of the above packages to run for 30 days. Like it — keep it and the included program or — take us up on our money-back guarantee.

If for any reason you don't like what you see, return for a full refund. We think it's going to be love at first sight.

Dealer inquiries welcome. Call for our Dealer Profit Plan and source code prices.

There's No Business Like Screen Business

- ☐ Here's my check, send me
☐ I'm a dealer, I know the show must go on, send me Star's
Incentive Plan.

Name _____ Phone _____

Company _____ Address _____

City/State/Zip _____

* registered trademark of Digital Research
** registered trademark of IBM



Star Computer Systems, Inc.
18051 Crenshaw Boulevard
Torrance, California 90504
(213) 538-2511

Editorial

Pascal enrolls in frosh class

The dilemma: Too few programmers are trained in the ways of "structured programming." Structured programs can be read by others, can be demonstrated to be correct and thus reliable, and can be easily debugged. Structured programs more closely follow the logic used in solving a problem than an unstructured language.

One solution: Introduce a language that has some structured-programming concepts to the schools now teaching future programmers.

The language is Pascal, and the imposition is being performed by the College Entrance Examination Board, a powerful academic organization that oversees the Scholastic Aptitude Test (SAT) and a series of Advanced Placement (AP) tests that allow college freshmen to skip an introductory course if they can demonstrate a fundamental knowledge of the subject area.

Math, science, writing and history are some subjects the CEEB has written advanced placement tests for. The merit of the AP test has been established, since it allows students to demonstrate the worth of their high-school studies. The United States lags behind other countries in providing college-level courses at the secondary-school level, but our AP tests demonstrate what better students in good schools can achieve.

Now the CEEB is creating an AP test that evaluates freshman ability to write structured programs. It is the first computer-related AP test, and it has generated some controversy because Pascal is the language the CEEB chose to use both in the test and in preparatory high-school courses for the test (*InfoWorld*, September 6, 1982, page 29).

The controversy revolves around two issues: one financial, one philosophical. The financial criticism stems from the fact that BASIC is still the most popular programming language in secondary schools today. Schools will have to spend millions to purchase Pascal compilers and even more microcomputers, since many low-end micros have no true Pascal compiler available, at least from the hardware manufacturer.

The philosophical qualms about Pascal were best expressed by BASIC advocate Bob Albrecht, who described creative programming as "messing around with things until the shape starts to happen. Afterwards, I go through and I clean it up, structure it a little bit and block it. But I don't create that way, and it would interfere with my creativity to have to use Pascal."

Why can't BASIC and Pascal exist side-by-side in the schools? No one is suggesting that Pascal be the first and only language students learn. Clearly, the AP test is aimed at those students who are going to make their living programming and writing code. Those who have used it believe that Pascal builds strong structured-programming habits (such as avoiding the GOTO statement) and this in turn leads to more understandable and reliable programs. Isn't this what the industry and users want?

Also, the plethora of different BASICs is presently an unsolvable mess. Someday we may have a more structured BASIC. Not today. The cost of converting from the many BASICs to one particular BASIC would be considerable in itself. Pascal is far more standardized than BASIC at this point.

Just because Pascal is the language of choice in the AP course does not mean BASIC or other languages are going to go away—far from it. Students will still use an interpretive language such as BASIC or Logo to write their first program. Many students—those who don't go on to become programmers—may never have to learn Pascal. At any rate, all students will be exposed to languages that stimulate creativity, and this is sure to have an impact on the "uncreative" structured-programming world.

Eventually, Pascal will be replaced by better languages; that is almost certain. As we mentioned here last week, a whole army of new languages waits in the wings. For now, for this small group of future programmers in the schools who are ready for something more challenging than the version of BASIC they mastered in junior high, we think Pascal is an excellent choice.—SAM.

Letters to the Editor

Manufacturer's responsibility

Upon reading "Reader finds more duds, dolts in computer business" (*InfoWorld*, August 16, 1982), I almost vibrated out of my chair in agreement.

I'm pleased that more people are speaking out against the widespread abuse of the unwary buyer.

Computers are a new market, and as in any new market, there are many pseudo experts who have only a superficial knowledge of the product they are promoting. The reason this occurs, I feel, is not simply the salesman's lack of knowledge, but rather a more serious dilemma—that the manufacturer (of computer equipment) fails to educate the customer and to disclose important information about how its product works and what it is composed of.

This is not to say that salesmen couldn't be better versed in the practical aspects of what they are selling. Indeed, this is true, but I feel the manufacturer could do more to ease the confusion that exists.

Steve Giarratana
Glastonbury, CT

'Disque,' anyone?

In the August 23 issue of *InfoWorld*, you print letters settling the matter of disk vs. disc in current usage in the information community. Left unresolved is any special meaning for the spelling *disque*. I know of none, which probably means we have a spelling for one more variation, one more device. Any candidates?

J.B. Post
Cartographic Information
& Format Specialist
Philadelphia, PA

Names sound same

Douglas L. Chew (Viewpoint, "Keep the customer satisfied"), needs to be advised that the company name he has chosen (Uni-Tech) is a sound-alike for several other firms. Being aware of this may help him avoid some possible problems.

Our company, Unitek (a short form of Unique Technologies), has been in business for several years. We develop custom hardware and software and also serve the needs of the 6800/6809 community with standard packages.

Our name occasionally causes confusion when we deal with customers who are familiar with some of our "namesake" companies. For example, a company in Maryland has the name *Unitec*. There is also apparently a dental-electronics firm by the name of Unitek or Unitich.

Mr. Chew may experience even more problems, since there is already one microcomputer firm by a similar name in existence (us!). If Mr. Chew has not yet started operations, he may wish to consider another name.

If, on the other hand, he has already committed, we wish him the best of

luck in his efforts. It would also hope for minimum confusion on both our parts!

Thank you for your attention to this matter, and for a fine newsworthy.

Richard H. Rae
Emporia, VA

Is documentation good, bad or 'ugly'?

As a technical writer working in San Francisco, I was good to see an issue of your magazine devoted to documentation.

Many of the problems inherent in this field were finally brought to print: documentation as an afterthought, programmers changing the product as it goes out the door, the source of information speaking to you only because he has to, plus the obvious delight of writing something no one really wants to read.

What I did find curious, however, is the tone of most of the criticism concerning documentation. With the exception of IBM's work, most writing was roundly panned.

This is curious because for a year now I have been following the documentation ratings in your software reviews and they have been consistently given "good" marks. The "excellent" and "fair" reports appear equally and balance each other out; "poor" appears rarely, and "putrid," as one man considered the lot, is not on your chart.

Are the reviewers being too nice? Is the material better than we think? And does anybody really care? I ask this because for three weeks now there has been no response printed in *InfoWorld* concerning the focus of that issue.

I'm beginning to wonder if I shouldn't have gone to Hollywood and become a screenwriter.

Christopher Hunt
San Francisco, CA

Beware of overnight micro entrepreneurs

This is a reaction to your editorial, "Dingdong, Micro calling" (*InfoWorld*, September 6, 1982).

As you put it, "A disturbing aspect of this system is the emphasis on sales." Later on, you are encouraged that the "new direct-sales entrepreneurs own and use the computers they sell." One of the two Texas-based companies that you reference, Tronics Marketing, requires only the purchase of a sales kit (cost, approximately \$16) to become a distributor for the TI-99/4A and its software.

This is disturbing; it sets the stage for the innocent purchaser of a personal computer to be treated to a crass and frustrating introduction to what could be an exciting and rewarding experience. All this due to the inexperienced (the new direct-sales persons are not necessarily computer owners) entrepreneurs.



Obviously, constant vigilance by *InfoWorld* through its editorials may help prevent this problem from becoming larger than it is at present.

John M. Ward
Norristown, PA

Barry's good humor

Congratulations to John Barry on being one of the small handful of people writing for the computer industry who have a sense of humor and a sense of perspective.

Bob Pierce
San Rafael, CA

Miracle micros: how does it work?

John Barry's column devoted to documentation was true to the mark. Micros are miracles, but the plea from most initiates is, "Won't someone please tell me how to make this thing work?"

Chuck Adkinson
Benbrook, TX

You can't justify software piracy

Software piracy is a sort of Everyman's white-collar crime. In the absence of a weapon or the need to confront one's victim and look him in the eye, people find white-collar crime easy to accomplish.

After the crime, in order that they might sleep better at night, these criminals engage in a lot of rationalizations for stealing the software. "The price is outrageous," "the support is terrible," and so on; we've heard all the excuses. But that's all it is: excuses and rationalization, not justification.

Contrary to what the rationalizers say, if software were dirt cheap, they'd still copy their buddy's software because the crime would be of a lesser magnitude and even easier to rationalize. ("So what, at most they were gonna make two bucks off me. What's the big deal?")

The excuses just won't wash. If piracy can't be justified, however, then neither can highway robbery (for example, \$30 for a single backup copy of a program you've already spent several hundred dollars for).

Piracy is going to be with us as long as the perceived benefits outweigh the

potential risks and costs. I don't mean just the risk of being caught, either.

Time and again we've been told that piracy hurts the software business. We know that it raises the cost of all software or else lowers the quality. (When the publishers respond by incorporating copy-protection schemes, it does both.)

Logically, with fewer sales and therefore less money for R&D, it is going to take longer to develop good software. That hurts every one of us. Let's say that for lack of venture capital, it takes an extra 90 days or six months for a particular program to hit the market. If that program can save 2000 firms just one or two hours of work per day, then imagine how much it has cost them not to have it sooner. These costs are, naturally, passed on to the consumers that's how the firms manage to stay in business.

No, I haven't come up with the solution yet, but I've been thinking about it while I watch the protection-scheme and nibble-copy version numbers increment almost monthly. It's both amusing and saddening because the only ones really being inconvenienced are the average folks just trying to get the most out of their software. Certainly the professional bootleggers aren't impeded much.

In the meantime, I applaud outfits that don't lock their software for their courage in coming down on the side of the legitimate software purchaser/user.

Warren Michelsen
Page, Arizona

Foghorn access

We wish to thank you for the complimentary mention of our group and our publication, the *Foghorn*, in your August 9th issue (p. 29).

It is a credit to the influence of your publication that your article on FOG (First Osborne Group) and the *Foghorn* newsletter was able to generate such a tremendous response from your readership.

Before our article we were receiving approximately 50 inquiries a month; since publication of the article we have received over 400 letters asking for further information or for subscriptions to the *Foghorn*.

In many cases, the writer stated that he knew of our existence but was reluctant to join as he was unsure about the benefits that he might receive; your fine review was the convincing proof that he needed.

The one correction we would like to make is that all correspondence should be sent to the following address: FOG, Box 11683-A, Palo Alto, CA 94306.

We would also like to thank all users who have written to request more information. A current copy of our newsletter should be reaching you shortly. As much as we would like to answer all questions personally, the volume of mail is just too large; hopefully, we'll answer all questions in upcoming issues of the *Foghorn*.

Thank you very much.

Frank Morton, President
FOG
Palo Alto, CA

Viewpoint

Not with my computer, you don't

By Tony Karp

There are two classes of people who use computer-based systems—the ones who have their own computer and everybody else.

I've spent most of my time in this field designing, building and using microprocessor-based systems, or, if you will, single-user systems, that the average large-system user considers to be rather on the Spartan side. In each case, however, I've had my own computer, as in, "Here's your desk, your telephone and your computer."

Recently, I had a chance to work with a couple of large on-line multi-user systems, and the difference was startling. I had imagined that using a giant computer system would be like stepping up from a Piper Cub to a 747—the multiuser system could obviously run rings around my single-user system. And sometimes it did.

Sometimes, however, there were a lot of users signed on and someone would be running a long job, and the response time would gradually deteriorate from terrific to dreadful. One time, I signed on and nothing happened for almost two minutes. A real test of faith.

And so I learned the biggest difference between single-user systems and multiuser systems is the response time. Not that one is faster or slower—it's the *uniformity* of the response time that varies.

The single-user system may be the less powerful, but with it, the same function always takes the same amount of time to perform.

Sitting at the terminal of my dedicated single-user system, I call up the text editor to work on a document. I close my eyes and take a deep breath. About four seconds. When I open my eyes, there's the text editor, just like I knew it would be.

Now I start entering text. After each line, I hit Return, take a deep breath and there's the prompt. Just like I knew it would be. Pretty soon, I fall into an easy rhythm, and the fact that I'm working at a computer terminal vanishes as I become more involved in the easy flow of the work at hand. The system is my partner, it doesn't stand in my way. I'm in control.

On the other hand, preparing a document on the timesharing system was a mind-bending experience. After the sign-on ritual was completed, I was finally allowed access to the text editor. This took anywhere from 20 seconds to five minutes, so I always brought something to read.

Now to enter some text. Type in a line, hit Return and put your mind on hold. Where's the damned prompt? I wonder if the system's crashed. There it is. What was I doing? Let's see. Oh yes. And so on.

You get the idea. There was no way to get that essential rhythm going while I was devoting most of my attention to waiting for the prompt. It utterly destroyed my concentration.

The printers for the timeshare system, the finest money could buy, were located on my floor, but at the other end of the building. My life became an exercise in frustration, as I would go all the way to the machine room only to find that the printers had been taken off line. Or that someone was printing a thousand-page document that would tie them up for several hours. All I wanted was to see a few pages of my document on real paper.

(One possible answer to this problem is to have each terminal display some sort of indicator that shows the current response time of the system. Such feedback would give users more of a feeling of being "in touch" with the system.)

There's another side to this picture. Those things attached to the multiuser system (like so many baby pigs to the mommy pig) are called *people*. Using a system with a variable response time, people become demoralized, demotivated and may avoid using the system if at all possible.

With all the talk of productivity, something should be given to the users of the system. For the highest productivity, it's better to have 100% of a small computer rather than some varying fraction of a giant megacomputer that may not even be in the same state as the user.

I know of one large DP installation where notes concerning the state of the system are posted on the bathroom doors. You can check the availability of the system and answer a call of nature at the same time.

That's why I feel the way I do about having my own computer. I'm spoiled, but very productive. Sharing a computer is like sharing your toothbrush. How do you know where else it's been?

Software for People/Paul Heckel

Conceptual integrity and design

Paul Heckel writes software for hand-held computers. In this penultimate installment of his continuing series on user-oriented software design, Heckel stresses the need for both communications skills and technical skills in good design.

An honest job of design should flow from the inside out, not from the outside in.

—Henry Dreyfuss

A screenwriter should have knowledge of direction, of cutting, of all the separate functions, before his imagination and talent can be geared effectively and skillfully to his chosen work.

—Dudley Nichols

There is a division between marketers who know the user and his problems but don't understand software design, and software engineers who know software design but don't understand the user and his problems. People who understand both software design and the user's problems are hard to find and harder to replace if they leave.

The division into marketing and engineering often produces acceptable solutions, such as negotiated specifications. But no one understands the user's problems and the technological possibilities. No one person can understand and put together all the important aspects of the problem and the trade-offs involved to produce an integrated solution that has conceptual integrity for the user.

Conceptual integrity is a broad concept that should encompass a technical solution in the context of a market, its users and the users' problems.

Provide vision

In *Technology and Change*, Donald Schon shows that the entrepreneur, a person who understands both the market and the technology, provides the conceptual integrity of an innovative solution to the problem in a way that no established firm, with its division into marketing and engineering, can.

Developing a product, particularly an innovative one, can be like solving Rubik's cube—everything is interconnected. Making one person responsible for red, blue and green, and another person responsible for white, orange and yellow, can generate more problems than it solves.

Conceptual integrity is crucial in communications. Usually, one or two individuals provide the vision and most of the critical work. Books are usually written by one author. Even films, which by their nature are a group effort, are usually the result of the vision and work of only a few individuals.

The designer must know the subject he is presenting and he must know the limits and opportunities of software technology. He must immerse himself in the user's world. Only then can he see neglected possibilities, unworkable requirements and the myriad of details from which he can form a solu-

tion that has conceptual integrity.

Experience shows that software designers design user-oriented software poorly and also write poorly. I don't think this is coincidental, since both designing and writing are forms of communication. Software designers think logically, whereas writers and other communicators think perceptually. We need designers who can both think as communicators and who know the software media.

Henry Dreyfuss, the industrial designer, was a firm believer in knowing

the technology. Early in his career (in the infancy of industrial design), he was one of ten artists who were offered \$1000 by the telephone company for ideas on the form of future telephones.

Dreyfuss declined the commission because he strongly believed that designs of external form alone were irrelevant. He insisted on working with Bell engineers to learn the technology so that he could design "from the inside out."

The telephone company didn't accept his terms; it felt this would limit artistic scope. But when the designs other artists submitted proved unsuitable, the telephone company hired Dreyfuss to work the way he wanted. Dreyfuss had a long association with the telephone company. His many de-

signs included most versions of the familiar desk telephone.

User-oriented software design must also flow from the possibilities that software technology can offer us.

Someone who does not know the technology can't design software because he does not know the techniques of the craft. People who are not experienced software designers don't know what the technology makes possible, what it makes easy and what it makes hard. They don't know or understand the technical risks or problems.

An early version of the Language Translator I designed, for example, had a table showing how various letters were pronounced in foreign

See *Software for People*, page 37

CALL 1-800-1-3

EAGLE SOFTWARE

MONEY DECISIONS is a comprehensive collection of business and financial problem solving tools that can be used not only by a computer expert but by the every day businessman. It is completely programmed and requires no programming knowledge. There are 34 program functions including:

- Compounded interest or growth
- Lease/purchase analysis
- Discounted cash flow
- Optimal quantity selection
- Depreciation
- Break-even analysis

MONEY DECISIONS has been designed for people who must make frequent decisions in accounting, banking, annuities and investments financial planning, real estate and estate planning.

MICROHOUSE PRICE \$199

SUPERSOFT SOFTWARE

DISK DOCTOR for CP/M is a program that automatically recovers "crashed" diskettes. Easy to operate. **DISK DOCTOR** is comprised of five "wards" capable of performing a specific diskette recovery operation:

- Ward A: Verifies diskettes and locks out bad sectors without touching the good files that still remain
- Ward B: Copies whatever can be read from "crashed file" and places it into a good under user control
- Ward C: Copies diskettes without stopping bad sectors
- Ward D: "Un-erases" files. Will recursively erase disk files
- Ward E: Displays directory of erased files

DISK DOCTOR requires: disk CP/M; Two drives are needed for not work with double sided or hard disk.

List Price \$100

MICRO

DEALERS 1444

Word processors act as nonhuman stenographers

By Joel Pitt

Word processing is one of the most popular uses of personal computers. In fact, it was one of the first practical applications I found for my own Apple, and I'm a computer professional. The large number of word-processing packages available for microcomputers verifies their popularity.

The availability of so many word-processing packages creates a quandary for Apple owners who want to use their computers for word processing but have not yet settled on a word processor. Reviews are helpful, but they don't always make the choices clear.

In a series of articles, I'll tell you about word processors in general and then describe several packages available for the Apple II. This way, you'll become familiar with what to look for as you evaluate word processors.

The proper choice of word-processing software depends strongly on your individual needs and tastes. At the moment, no word processor exists that is best for everyone. Instead, a large number of possible choices, each with significant strengths and certain limitations, present themselves.

To choose wisely, you must understand what word processors can do and how you want to use your word

processor. In addition, you'll want to weigh the trade-offs between versatility, ease of use and other factors that were made in the design of each word processor. Finally, you must understand how to deal with limitations of computer hardware and how to capitalize on special hardware features.

Let's look at what word processors do. To begin with, a word processor must combine the functions of a stenographer, a typist and a layout artist. Specifically, a word processor lets you record a body of text within the computer; just as a stenographer records a body of text on paper, and displays that text in a specified format or layout

in a hard-copy medium, just as a typist transfers information to paper.

These two functions, editing and formatting, are the vital center of a word processor.

The editor function allows you to enter and create the body of text you want. You have to type text into the computer and have the computer hold onto it ("take a letter, computer"). Since you'll usually want to change the text you've entered, the editor must also allow you to make changes—just as you could tell a stenographer to cross out a word of dictation and replace it with another.

As stenographers, computers have both advantages and disadvantages compared to their human counterparts.

Certainly, the greatest disadvantage of computers today is their inability to accept spoken input.

If you're comfortable using a typewriter, however, the real disadvantages stop there. In addition to its even temper and neutral disposition, the word processor changes text quickly and certainly.

Once a stenographer finishes taking dictation, you can only change the text with difficulty. You can, of course, cross words out easily, but it can be quite difficult to write down new words in their place. If you must insert extra words within a handwritten document, in addition, you run the risk of illegibility.

Computers equipped with word-processing programs, on the other hand, change or delete words or groups of words within a body of text. They can readily insert letters or words or blocks of text within an existing text, and they can quickly search through many pages of text to find the words or phrases you specify. ■

Software for People

continued from preceding page
languages—showing that an S on the end of a French word was silent, as in *vous*.

If the user wanted to use this feature to pronounce a whole word, he would have to look up each letter—a clumsy procedure. To simplify, I designed a cartridge that contained a program to go through a whole sentence and spell out, for example, *s'y voo pleh for s'il vous plait*.

I am not saying that someone need be an expert designer with many years of experience. Indeed, the success of some software amateurs shows the fallacy of that approach. What I am saying is that one cannot attain proficiency without expertise in the medium—in this case, software technology.

Since programmers are notoriously bad communicators, we need people who can both communicate and program, to design user-oriented software. Thus, we are faced with a dilemma. Who has the needed communications skills and software skills to design user-oriented software? Some programmers will pick up the communication skills and make the translation; others will come from outside the field. ■

1. FREE
23-9511
SYLVANIA
668-8219

MICROHOUSE

SUPERSOFT SOFTWARE

SCRATCH PAD 2.0 is an innovative financial planning program that offers the ultimate spreadsheet. **SCRATCH PAD 2.0** with virtual memory of entries by letting your disk drive act as secondary memory when you run out of RAM.

- Virtually unlimited number of entries by letting your disk drive act as secondary memory when you run out of RAM
- Unlimited screen widths
- Variable column widths
- Built in algebraic functions include:
 - Cosine
 - Sine
 - Square Root
 - Exponentiation
 - Interger
 - Absolute Value
 - Tangent
- **SCRATCH PAD 2.0** can interchange data with **STATGRAPH** and **DATA-VIEW**

8" CP/M compatible; requires disk

LIST PRICE \$295

DIAGNOSTICS II is the finest set of system maintenance routines available for microcomputers. **DIAGNOSTICS II** thoroughly checks all five areas of your computer system, pinpointing hardware problems that may keep your system from being in perfect working order.

The areas of your computer which are tested in:

- MEMORY
- PRINTER
- TERMINAL

LIST PRICE: \$125

DISKS
• CPU

MICROHOUSE PRICE: \$99

Price, specifications and availability subject to change without notice.

able

operation. Will

Price \$84

WELCOM
P.O. Box 498
Lehens, PA 18016

When transactions of APPLE COMPUTER, INC. are reported to the IRS, the user must include a statement of the source of the funds. This statement must be included with the return. The user must also include a statement of the source of the funds. This statement must be included with the return. The user must also include a statement of the source of the funds. This statement must be included with the return.

DBgen, data-base manager that works with dBase II

By June Moore

If you use dBASE II as a data-base manager, you can also use dBgen. dBgen formats your screen for data entry or correction and accepts input that uses the screen. The program simplifies your task; it even figures out the specifications for the fields in your data-base programs.

dBASE II is a data-base manager from Ashton-Tate that lets you join data bases; create new data bases from selected fields in existing ones; modify fields, as well as individual data items within a data base; and generate reports from the data in any form you desire.

dBgen has the same operational requirements as dBASE II: 48K of memory, CP/M 2.X, dBASE II v.2.3, a cursor-addressable terminal, one 8-inch, single-density disk drive and, optionally, a printer. It is sold by Active Computer Enterprises of Tempe, Arizona, at a listed retail price of \$195, but you can buy it at an introductory price of \$95.

All you have to do is draw a picture of the input screen you would like, using a text editor or the dBASE II Modify facility. dBgen then writes all the command files necessary to use the pretty screen you designed in place of the said file structure that dBASE II pro-

vides. Best of all, you don't have to figure out how many characters or decimal places your data items will use. dBgen does that automatically for you.

You get the program on a single disk, which includes the installation program. Installing dBgen is unusual, since it requires your configured version of dBASE II to borrow the routines for the cursor and other hardware-dependent items. Therefore, you do not have to scare up your terminal handbook to find the codes for "up cursor" and "clear screen" if you have already done it for your dBASE II.

You simply put your copy (you did

copy the dBgen master onto a new disk, didn't you?) of dBgen in the A: drive of a CP/M machine and your configured copy of dBASE II in the B: drive and type dBgen. The supplied installation program takes over and does the entire job. Nothing could be simpler, no errors, no hangups!

Next, using your text editor, you create a file that displays all the data fields that you desire, in the place you want them to appear when they are displayed on the screen. Numbers are indicated by including a period in the variable you use to name the field. The name of the field as you want it to appear on the screen is typed out at the

Finally, a MULTI-USER micro for professionals by G&G Engineering



Shown: WordStar™ from MicroPro

EXPANDABLE

You can start with a single user installation and add users as your needs grow. The G&G system can be easily expanded in field—just add more memory.



Shown: SuperCalc 86™ from Sorcim

Hard Disk Based Multi-User Systems start at \$10,500

MP/M 8-16 is a proprietary implementation of Digital Research's MP/M 86 operating system, configured for CompuPro by G&G Engineering. CompuPro is a trademark of G&G Engineering. CP/M and MP/M are registered trademarks of Digital Research. SuperCalc and SuperCalc 86 are trademarks of Sorcim. dBASE II is a trademark of Ashton-Tate. WordStar is a trademark of MicroPro. CompuPro is a trademark of Godbout Electronics.

MULTI-USER MP/M™ 8-16™

Up to seven users can run their own programs with their own protected data or share common programs and data. High speed DMA hard disk and cache memory give this system fast access to data, so you avoid bottlenecks.

G&G's MP/M 8-16 systems have been shipping since March, 1982. They are field proven!



Shown: CompuPlot™ from G&G Engineering

8 and 16 BIT CP/M™ COMPATIBLE

Each user can run the vast inventory of 8 bit CP/M programs, or choose from the library of powerful new 16 bit CP/M 86 software. Your past investment in CP/M software is protected, while at the same time the door to the 16 bit world is opened to you.

SUPPORT

We wrote the book on 8/16 bit multi-user systems. Our phone support is the best in the business. Plus, CompuPro components in G&G systems carry a two year factory-backed warranty.



Shown: GL by Structured Systems Group

UPGRADABLE

The G&G system is based on the IEEE 696/S-100 bus and uses CompuPro's state-of-the-art components. Our 20 slot bus guarantees that you will never be left in a corner with obsolete technology. Your investment in hardware is protected.



Shown: dBASE II™ from Ashton-Tate

G&G Engineering is an authorized CompuPro systems center.

G&G ENGINEERING

1922 Republic Avenue, San Leandro, California 94577 (415) 895-0798
230 California Street, Suite 207, San Francisco, California 94104

InfoWorld Software Report Card

dBgen

	Poor	Fair	Good	Excellent
Performance	☐	☒	☐	☐
Documentation	☐	☐	☒	☐
Ease of Use	☐	☒	☐	☐
Error Handling	☐	☒	☐	☐

System Requirements

- CP/M
- dBASE II
- 48K RAM
- One single-density, 8-inch disk
- Printer

Price: \$95 (introductory)
\$195 (regular)

Active Computer Enterprises
1953 East Apache Blvd.
Tempe, AZ 85281

location you want it, followed by its variable name enclosed in brackets.

After the program has designed your screen for data entry to your satisfaction, you run it through dBgen. dBgen asks you, through a menu, whether you want automatic file generation or whether you want to perform each function separately.

I tried the automatic method first, and shortly after invoking it, the program asked me for the name of my application file and the name I had assigned to the screen-display file. After that I just sat there as the screen displayed what the program was doing—“generating application file,” “creating G/ <filename>” and “printing out analysis.”

A note appeared in the upper-right corner of the screen telling me to type “DBASE <filename>” (that was the application filename I had given the program) to run the new configuration.

A listing of the CP/M disk directory showed two new .CMD files, in addition to the required DBGEN.CMD and the ODDJOB.CMD. Their names were F/ <filename>.CMD and G/ <filename>.CMD. A file, <filename>

DGB, had also been created in the process.

I used the PIP command on the newly generated CMD files, as well as the dbggen.CMD and ODDJOB.CMD files included on the master disk, to move them to the disk that had DBASE II on it and typed DBASE <filename>. DBASE II signed on in the usual way and jumped to a menu offering me these options: "add new records," or "erase or recall records." Since I had no data in the data base, I chose to add a new record to the file.

Promptly, the screen I had designed for data input appeared, with the cursor positioned over the first item. As I entered each item in its proper field, the cursor moved to the next item. When a record had been completely entered, the program asked if I wanted to make any changes. When I finally answered that I didn't want any more changes, the program asked whether I wanted another record. If I didn't, the program returned to the dbggen menu.

An exit from the menu back to CP/M, but no exit back to DBASE II, is provided.

When I reentered DBASE II without my filename in the command line, I was able to look at the data base file created by the .CMD files, and it was just like those I'd created directly under DBASE II. I could manipulate the data, examine or evaluate it and generally handle it just as though I had entered it under DBASE II using the file-structure listing. I looked at the file structure, using the Display Structure command, and found it was just like that created by DBASE II. In fact, DBASE II apparently doesn't know that it has been bypassed, and dbggen doesn't tell it.

You can control the sequence of data entry and other DBASE II functions when you design the screen by using the five commands dbggen provides: !COMMENT, !SET, !KEY, !GET and !LINE. Each of these commands must be preceded by the exclamation point, but you can enter them with only the first letter of the command; so !C = !COMMENT.

By the way, the !Comment refers to a comment that you add to the printout of the file structure to explain the field variable. !Set lets you change delimiters; for instance, you can use @ for [a and the like. !Get defines the order in which the cursor attaches itself to the screen field; that is, it controls the order in which data is to be entered.

The !Line command identifies the line on the CRT at which a data entry is to appear on the screen. You use !key to specify the key on which you'll be indexing. You can include any of these commands in the screen file, but they won't appear on the screen.

dbggen checks errors on these commands, and if you make a mistake, it will tell you by pointing to the error on the screen and ringing the bell on your terminal. You can include program contents in the screen file by starting a line with an asterisk.

In processing your screen design, dbggen creates a length-definition file for each field, with the position on the screen for each item to be displayed in the dBASE language. You receive a "sample" screen, complete with errors for your correction.

PERFORMANCE: dbggen does its job well, with efficiency and a minimum of

user input. It is disappointing to note that the main menu lists several functions that, when you choose them, simply advise that this function is not yet available.

I found a small glitch in the display of records under the dbggen.CMD file. I called the vendor and spoke to the program's author, who promptly called me the next morning to tell me that, yes, the glitch was there, but that it had erroneously been given a file that had not been modified to work with another modification.

He said the vendor was checking to see who else had received incorrect copies. They sent me a corrected copy, which still did not display records or write them to the data base correctly when I asked it to do so before exiting

the .CMD program and dBASE II. When I reentered dBASE II without first displaying the records under dbggen, however, the display worked well.

Of course, the program is of interest only to dBASE II users, so its performance must be judged in terms of usefulness for them. When I viewed the program from that perspective, I found it nice to have a formatted screen for data input, especially for designing data bases for someone not familiar with computers or dBASE II. The formatted screen might not be all that useful for people who program on a single-user machine.

The menus and screen displays of dbggen itself are superb examples of what can be done with CRT highlight-

ing and cursor and display positioning, even without graphics.

EASE OF USE: The basic program is simple and easy to use, since the supplied programs do all the work. You just sit and watch the screen to see what is happening. Any complications are a function of your understanding of dBASE II.

ERROR HANDLING: Little error handling is required, since the files dbggen generates will be used by dBASE II, but dbggen tells you when you make an error in creating the screen file. Unfortunately, you must go back to the text editor to correct the error, but that is a minor defect, since the screen file is not a long one.

DOCUMENTATION: Perhaps the *See dbggen, page 40*

BUILD PASCAL PROGRAMS FASTER

By adding our software to your PASCAL system.

LinkVideo™

REDUCE SCREEN I/O PROGRAMMING 90%

- create terminal independent programs
- safeguard programs from user error
- validate, filter and prompt input
- give programs a professional look
- simplify screen handling
- source and P-code included

LinkDisk™

GET FOUR FUNCTION DISK CONTROL

- examine and change any byte on disk with easy-to-use screen editor
- print text files selectively
- guarantee correct readable copies
- convert Dos 3.3 text/binary to Pascal

Learn Pascal the active way with LinkSampler™

- Pascal techniques illustrated
- 21 teaching programs
- 68-page easy reading manual
- games and personal finance

Link software is Corvus compatible.

DataLink™

ERROR-FREE MAINFRAME COMMUNICATIONS

- transmit/receive up to 4800 baud
- control entire session with 1 key stroke
- dial and retry automatically
- send concurrently to screen, printer & disk
- complete error-checking
- also supports Apple-Cat II™ at 1200 baud

LinkIndex™

USE THE FASTEST KEY RETRIEVAL SYSTEM

- sophisticated B-tree indexing method
- 1 record from 25,000 in less than a second
- maintains sorted order
- supports duplicate keys
- easy to use Pascal unit

LINK SYSTEMS™

1640 19th Street • Santa Monica, CA 90404
© 1982 Link Systems Inc. (213) 453-1851

Payment by ☐ Check ☐ MC/VISA
for Apple II Apple III
LinkVideo ☐ \$54.95 ☐ \$54.95
LinkDisk ☐ \$69.95 Not Available
DataLink ☐ \$99.95
LinkIndex ☐ \$149.00 ☐ \$195.00
LinkSampler 1 ☐ \$59.95 ☐ \$59.95
(Call residents add 6%)

Shipping: In USA add \$3.00 for first product and
\$1.50 each additional. Foreign add \$10.00 handling.

Acct. # _____
Name: _____
Company: _____
Address: _____
City: _____ State: _____
Zip: _____ Phone: _____
Signature: _____

Please rush me info for:

- ☐ LinkVideo
☐ LinkDisk
☐ DataLink
☐ LinkIndex
☐ LinkSampler 1

NEW! Data Fax
the simply powerful
information manager

DEALER INQUIRIES WELCOME

Apple trademark of Apple Computers Inc.

Apple-Cat II trademark of Novation Inc.

Create crossword puzzles with Crossword Magic

By David L. Heller

Crossword Magic allows you to create, save and print computer-assisted, English, nonsymmetrical crossword puzzles in just a few minutes.

I reviewed the Atari Version: L & S has since released a combined Apple and Atari version of Crossword Magic. **FEATURES:** After the program boots up automatically, you get a simple six-choice menu: (1)CREATE A PUZZLE; (2)PRINT A PUZZLE; (3)TRANSFER A PUZZLE; (4)DELETE A PUZZLE; (5)COMPLETE A PUZZLE; and (6)EDIT A PUZZLE.

To choose an option, you simply press the proper number key, then

press the Start key.

Creating a puzzle using Crossword Magic is both fun and easy to do. After you select (1)CREATE PUZZLE and the Automatic Puzzle Sizing option, a small 3 x 3 square, empty crossword puzzle appears in the center of your monitor's screen. This is your working area and will expand as your puzzle grows in size. You can also elect to predetermine the size of your puzzle—from 3 to 20 boxes square.

As you enter each word, Crossword Magic automatically interconnects it on the puzzle's grid and displays a picture of the puzzle at the screen's center.

One of the nicer features is the computer's ability to relocate the word you are entering in all the possible available locations. This tightens up the puzzle and adds a professional touch. As your word moves about the puzzle, a numerical-sizing readout at the left of the screen displays rows across and down. This feature gives you the most compact puzzle design.

Well thought-out editing features are present in the program. Flashing letters identify each puzzle entry. Simply holding down the Control key while you press the letter X removes any unwanted word.

If an entered word doesn't fit into

the puzzle, the program will store it in memory, and can recall it automatically when space is available. The program displays the number of unused words at the left of the screen, and lists these words when you press the Option key and the letter U.

Crossword Magic lets you save your puzzle to disk, at any time during its formation, for later recall and completion.

You complete your puzzle by typing in clues, up to 90 characters in length, for each word you enter. You then

InfoWorld Software Report Card

Crossword Magic Atari Version

	Poor	Fair	Good	Excellent
Performance	☐	☐	☒	☒
Documentation	☐	☐	☐	☒
Ease of Use	☐	☐	☒	☒
Error Handling	☐	☐	☐	☒

System Requirements

- Atari 800
- 40K RAM
- On disk drive
- Graphics-type printers (see text)

Price: \$49.95

L & S Computerware
1589 Fraser Drive
Sunnyvale, CA 94087

dBgen

continued from preceding page
biggest defect in dBgen is its limited documentation. All documentation is on the master disk in a file called .DOC. Printed out, this file is six single-spaced pages. Unless you have some familiarity with dBASE II, you'll have trouble understanding the "manual."

In fact, the .DOC file suggests that you "put dBgen away and spend a week or two polishing your dBASE II programming skills" or "contact your dealer, explain your situation...You will probably be allowed to return the software for a refund" if you have problems.

Several questions I asked the author as a result of the glitch I found were answered in the second .DOC file I received—presumably, future purchasers will get it too. The "manual" justifies the limited documentation by noting that it should be adequate for programmers and that providing it on the diskette saves a lot of money for users who are familiar with dBASE II. **SUMMARY:** All in all, this is an interesting and unusual program. It is intended primarily for computer users who are installing dBASE II for other users or who are demonstrating the use of personal computers in a business environment. ■

FMS The Software Machine

Powerful Fast Responsive

Performance, speed, control, ease of use. That's what you expect from a finely tuned machine. And that's what your data management software should deliver too. The new FMS-80 Version 3 gives you this and more—a fully integrated Applications Development System that makes even the most complex application easy.

Almost everyone needs to manipulate information. With FMS Version 3 even a beginner can follow the simple menu selections and be off and running in almost no time. Customized screens and user menus are easy to design. Powerful full-screen editing makes entering, modifying, adding or deleting data a snap.

FMS makes getting your information out easy too. Interactive QUERY and comprehensive SELECT can extract the data you need almost instantly. Our powerful Report Generator can produce almost any imaginable report with minimal effort. FMS takes you by the hand each step of the way.

More Than Just a Database Manager.

If you've been around the track a few times already, FMS is for you too. Our enhanced Version 3 EFM programming language gives you total control. Our ISAM-like multi-key data structure, access to 19 open files, full string handling, alphanumeric variable, field and file names, 18 digit FP&BCD math, structured programming constructs and other advanced features make EFM the language of

choice for data management applications. FMS can make you more productive and save you time and money, whether you're developing a simple mailing list or a complex turn-key general accounting system.

The UNIX-inspired FMS Shell brings advanced capabilities like command stream manipulation and dynamic input and output redirection to the CP/M world for unprecedented control of the operating environment.

Don't Run Out of Gas.

FMS's capabilities go way beyond other data manipulation programs. More fields per record, more open files, more variables, more everything.

	FMS dBASE Condor		
Maximum fields per record	255	32	127
Maximum number of variables	281	64	0
Maximum number of open files in a program	19	2	2
Maximum number of open files in a report	19	1	1
Maximum display pages per record	255	3	1

Don't lock yourself into a system that can't handle the big jobs!

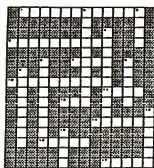
A Proven Winner

FMS-80 has been leading the field since 1978. Now Version 3 sets new standards for the future. Contact your local dealer for a test drive.



DJR Associates, Inc.

303 S. Broadway • Barrytown, N.Y. 10591
(914) 631-6766 • Telex 646792 DJR NTAR



Space Knights puzzle

DOWN CLUES

2. YOU MUST LEARN THIS TO TRAVEL IN SPACE
3. A CUTE FEMALE ROBOT
4. THE CREATOR AND WRITER OF SPACE KNIGHTS
6. FEARFUL PIRATES
8. ORACLE LIVES HERE
9. YOU MUST TRAVEL THROUGH THIS TO GO BACK IN TIME
13. NOT A NICE PLACE TO VISIT
15. HE MAKES THE BEST WINE IN THE UNIVERSE

ACROSS CLUES

1. AN ELITE GROUP
5. HE PROGRAMMED SPACE KNIGHTS
7. OUR HERO!!
10. THE BEST WINE IN THE UNIVERSE
11. OUR HEROINE!!
12. PLAYING AND READING SPACE KNIGHTS IS.....
14. HIS PICTURE'S ON THE COVER
16. IS THE PLACE
17. AN UGLY SERGEANT

name the puzzle and store it on disk for future play. The Crossword Magic disk can store up to 20 puzzles. You can save additional puzzles on a formatted blank disk.

To play your crossword puzzle, you use the Arrow keys to move a flashing cursor through the blank puzzle. Clues are displayed at the bottom of the screen that relate to each cursor location. You type directly onto the puzzle to fill in the blanks. When you are finished, you select the Answers option and the computer corrects and scores the puzzle for you.

The real magic of the Crossword Magic program is its ability to print out both puzzles and answers. The high-quality example shown at left is typical of Crossword Magic's abilities.

You can use a broad selection of graphic printers with this program: IDS Paper Tiger 440G, 460G, 560G; Microline A24, A34, 84; MPI 88G, 99G; Epson MX-80, MX-80 Type II, MX-100; Centronics 122, 352, 353, 739; NEC PC-8023; C. Itoh Prowriter; Anadex DP-9000, 9001, 9500, 9501; and Malibu 200. The Microline 82A and 83 printers require an Okigraphics ROM upgrade kit, and the Epson MX-80 printer requires a Grafix ROM upgrade kit. You cannot use the Atari 825 printer, since it does not have graphics capability.

PERFORMANCE: I put Crossword Magic to the acid test: my 12-year-old son. After only a few minutes at the keyboard (without reading the documentation), he was hard at work designing, storing and printing his own crossword puzzles. We found Crossword Magic easy to use for a variety of purposes; most important, it helped my son with spelling and vocabulary. I was also able to incorporate a puzzle generated by Crossword Magic into my upcoming book, *Space Knights*.

Crossword Magic is flexible enough for students of all grade levels to have fun learning geography, history or other subjects. The teacher or parent can easily incorporate any subject matter into the puzzles.

ERROR HANDLING: I was unable to find any errors after using Crossword Magic for more than a month. This program has been meticulously designed for first-time computer users. We were not able to "crash" the program; it always worked.

DOCUMENTATION: Both the program and its operating instructions are simple to use. The four-page brochure that accompanies Crossword Magic is well written, easy to follow and complete. A tips-and-techniques section helps you design a professional crossword puzzle. All the information in the brochure is presented in an orderly and easy-to-understand format.

SUPPORT: Technical support is available seven days a week from L & S Computerware. I called on a Sunday to ask if the program could be printed out on my Atari 825 printer; I was treated courteously and told that the 825 is a text-only printer. I was also told that I could call at any time, any day, between 7 A.M. and 6 P.M., if I had any other questions.

SUMMARY: The Atari version of Crossword Magic is exceptionally well designed. Apparently, L & S Computerware learned a lot from its earlier Apple version by ironing out all the bugs and listening to its users. For the educational value, this program is well worth the price. It's also lots of fun! ■

IMPORTANT MESSAGE

FOR: BUSINESS PEOPLE IN ANY SIZE COMPANY

RE: NEW MESSAGE RECORDING & RETRIEVAL SYSTEM

FROM: STANDARD SOFTWARE CORPORATION

TELEPHONED	PLEASE CALL	✓
RETURNED YOUR CALL	WILL CALL AGAIN	
WANTS YOU TO KNOW	SPECIAL ATTENTION	✓

MESSAGE: **MAILDROP™**, A NEW ELECTRONIC MAILBOX
FOR MICROCOMPUTERS IS NOW AVAILABLE!

• • • FEATURES • • •

- Message security — each user assigns a "password" to his/her mailbox. This password, when entered, never appears on the screen, and is "scrambled" before being stored in the computer to prevent anyone from being able to decipher it.
- Present or future message delivery — an indication can be made as to when in the future to deliver a message. A typical use of this feature is a salesperson sending a message to his own mailbox to remind him to call a prospect on a specific date.
- Multiple message delivery — a message is entered into the system only once, no matter how many mailboxes the message is sent to.
- Display or list feature — messages may be displayed individually on the screen, or all messages may be listed on the printer. After displaying a message, it may be deleted or left in the mailbox to be displayed again the next time the mailbox is checked for messages.

MAILDROP™
\$129



standard software
CORPORATION OF AMERICA
10 MAZZEO DRIVE, RANDOLPH, MA 02361
617-963-7220
800-343-0852

HOME OF MICROPRICING™

MAILDROP™ IS A TRADEMARK OF STANDARD SOFTWARE CORPORATION

Puzzle answers



Datebook, data-base office-appointment program

By John Ford

Datebook is a program that provides a microcomputer with the automated equivalent of an office appointment book and calendar. It is designed specifically for physicians and attorneys, but it may well satisfy other office time-management requirements.

This review covers the CP/M version of the program, which comes on one single-density IBM-formatted 8-inch disk. Datebook is written in Pascal and requires an 80 x 24 terminal display, a minimum of 56K RAM and 240K of disk space. Versions are available that run under Apple Pascal.

FEATURES: Aside from Datebook

and Pascal, three other essential programs are included on the disk. You get a configuration program (CONFIG) that customizes Datebook for any one of 34 "standard" terminals. A teaching-aid program (LEARNHOW) gives the novice practice in program data entry for Datebook. Finally, a formatting program (UNSTALL) sets up the data base for scheduling in a particular office.

You can think of Datebook as a specialized data-base manager. It must maintain and conveniently display information on appointments. It can, in fact, manage up to 27 people. In nine groups of three. A typical example might serve three attorneys who share

a law office.

You can schedule an appointment by specifying client name, nature of visit, date, time of day, attorney and length of visit. You can, with minor limitations, schedule internal conference times for all the individuals in your office. Datebook can even "search" for an opening in an appointment calendar and list possible times and dates for acceptance.

A day is a 12-hour period beginning with your normal starting time. You specify a basic time interval of 10, 15, 20 or 30 minutes and can schedule appointments for any multiple of that interval.

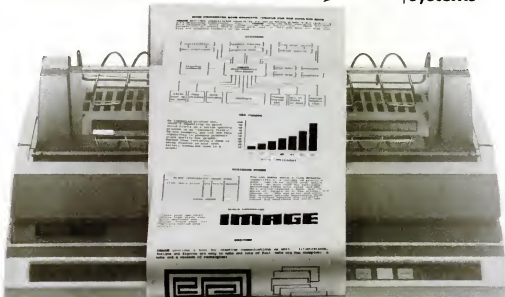
According to the manual, if you have a single-density 8-inch disk, you can handle over 3500 clients for a 252-day period. An example might be a doctor with three waiting rooms and a fairly heavy year-long patient schedule. Each waiting room can have an entry in the schedule.

An example (somewhat abbreviated) of the output appointment display from Datebook is shown in Table 1.

In the example, each schedule column is identified by a name. You can access the column of choice using a two-key command, with the restriction that the column identifiers must not begin with the same letter.

WORD PROCESSING IS NOW MORE THAN PROCESSING WORDS.

ANNOUNCING **IMAGE™** FOR **ZENITH** data systems



WORD PROCESSING WITH GRAPHICS... PEOPLE CAN SEE WHAT YOU MEAN.

IMAGE adds a new dimension to word processing... graphics! Now, you can combine text and linear graphics to create **BAR CHARTS, FORMS, ORGANIZATIONAL CHARTS, FLOW CHARTS, BLOCK LETTERS**, and much more. The result? More powerful and more effective communication. People can SEE what you mean.

TOP MARKS FROM INFOWORLD

IMAGE won top marks from **INFOWORLD** for its innovation, quality, reliability, and ease of use: "IMAGE certainly deserves accolades in the performance category."

"The documentation is simply superb. It is professionally done from cover to cover."

"Without a doubt, this program is easy to use."

"The program is bombproofed so well that I had trouble finding any errors."

IMAGE is a trademark of MicroArt Corporation.

InfoWorld
Software Report Card

Image

	Poor	Fair	Good	Excellent
Performance	☐	☐	☒	☐
Documentation	☐	☐	☒	☐
Ease of Use	☐	☐	☒	☐
Error Handling	☐	☐	☐	☒

All quotes are from InfoWorld's IMAGE software review, by Marty Petersen, June 14, 1982.
Copyright 1982 by MicroArt Corporation. All rights reserved. All trademarks are the property of their respective owners.

EXTRAORDINARY VALUE... "The modest \$295 Price Tag is a Bargain."

IMAGE runs on any Zenith Z/89 or Z/90 computer, on any Heath H/89 or H/90 computer, or on any Z-80-based CP/M system linked to a Z/19 or H/19 terminal.

**TO ORDER CALL TOLL FREE:
1-800-MICROART (1-800-642-7627)**
In Oregon, call: 1-692-3950

OR WRITE: MicroArt Corporation
200 Market Bldg.
Suite 961
Portland, OR 97201

MICROART
MasterCard, Visa and C.O.D. orders accepted.

InfoWorld Software Report Card

Datebook II Rev. 2.04

	Poor	Fair	Good	Excellent
Performance	☐	☐	☒	☐
Documentation	☐	☐	☒	☐
Ease of Use	☐	☐	☒	☐
Error Handling	☐	☐	☐	☒

System Requirements

- Z80-based system
- CP/M 2.1
- 58K RAM
- Dual 8-inch single density disks
- 80 x 24 terminal

Price: \$295

Digital Marketing
2670 Cherry Lane
Walnut Creek, CA 94596

Typically, the display shows the day and date at the top left corner. The screen is divided into three vertical fields with each field individually addressable.

Along the left border, the time of day is displayed in the increment for which the schedule has been preset (e.g., 10, 20 or 30 minutes). In the example, you see the time span from 9:00 to 12:00 displayed. Stepping the display to view another time span is simple.

You can set up a simultaneous automatic printout of your appointments, in the form of an event log, during the installation process. This is a safety feature.

PERFORMANCE: I brought Datebook up on a Z80 system with 60K of RAM, two single-density 8-inch disk drives and an ADM-3 terminal. Since the ADM terminal was one of the standard display terminals listed in the configuration-program menu, I had no trouble bringing the program on line.

The install program had an irritating, but inconsequential bug in the name-selection menu. It introduced an extraneous character at times in the first- and third-name fields after I entered my choice. This anomaly, al-

though confusing, did not actually carry over to the Datebook display after I had completed the installation process.

I set up a datebook schedule for an office consisting of nine groups of three people (27 persons). I found that Datebook allowed convenient access to each group.

Conference scheduling was moderately time consuming for this large office configuration (about five minutes when I attempted to include everyone). Scheduling is faster when fewer names are involved and when automatic logging has been disabled.

In a rigorous environment, such as an attorney's office, it might be a reasonable practice to set up the schedule format at monthly intervals, allowing you to put the disk containing the appointments for a previous month in an inactive file. Using this method, you would run the installation program once a month.

In a more leisurely environment, one disk might serve for an entire year, and then you would run the installation program only once per year.

EASE OF USE: I believe that Organic Software has made an honest effort to make Datebook easy to use—with minimal keyboard-entry commands—however, this is one product that begs for a dedicated system with integrated hardware and software.

The terminal-customization package is aimed at providing this sort of link. Unfortunately, it is not completely successful, in a permanent installation, perhaps color-coded keys would improve and simplify command entry. I feel that relatively inexperienced users will find this product somewhat difficult to master.

ERROR HANDLING: I intentionally forced several types of keyboard input error with Datebook. In every case, the program responded properly by identifying the error clearly and requesting that the input be repeated. The program quickly detected any attempt to overlap an appointment and provided appropriate alternatives.

Organic Software has detailed 16 "system" errors in the users' manual. All of these are described well. More than most software, this program must provide adequate information on error recovery, because personnel with little or no computer background will use it most often. I suggest computer novices arrange a trial run with their dealer.

SUPPORT: No technical hotline telephone number to Organic Software is provided. I did call Digital Marketing to satisfy several installation questions. People were courteous, prompt and knowledgeable.

DOCUMENTATION: Datebook includes a professionally prepared 77-page users' manual in an attractive looseleaf notebook. It contains a good table of contents, a subject index and several appendices. It gives a functional flow diagram that is helpful in obtaining an overview of software features. It also provides substantial documentation on error recovery.

The illustrations are limited to a few trivial examples that should have been expanded to serve the microcomputer novice. The menu options are described in sufficient detail.

SUMMARY: Datebook was written in Sorcim's Pascal/M, according to the

manual. It requires the Pascal run-time executive and library to be co-resident on the system disk. While this does not impose a serious disk-space limitation (33K), it is overhead that some users may object to. To be useful, this product requires a great deal of disk space—a dual 8-inch single-density system is the minimum configuration I could recommend. Hard disk would be much better.

Datebook appears to have all the elements necessary to satisfy many office time-management needs. It will probably find its greatest customer base among doctors and lawyers; however, professionals in other businesses and in engineering categories may also find Datebook a welcome and useful addition to their offices.

DATEBOOK for Mon Apr 23			
	Herold	Grady	Lambert
9:00			
1:00	IFred/Physics	IA Biss/Music	ID Quince/Math...
2:00	IB Einstein/Math	IC Fisher/Shop	IE Conference/Time
3:00	IC Conference/Time	IE Conference/Time	IF Conference/Time
4:00	IE Conference/Time	IF Conference/Time	IG Conference/Time
5:00	IF Conference/Time	IG Conference/Time	IH Bell/None
6:00	IH Bell/None	IL Leopold/Waste	
7:00			
8:00			
9:00			
10:00			
11:00			
12:00			

■ Table 1: abbreviated Datebook appointment display

In the next four years U.S. Independent Sales Organizations will sell more than 13,000,000 microcomputers.

And an expanded Computer Business News
will be helping them do it.

Computer marketing is in the midst of a revolution. And the Independent Sales Organization (ISO) is at the heart of it. These organizations are functioning as the third-party - the middleman - between computer manufacturers and the end user. Computer manufacturers who want to sell their products to the emerging mass market in the U.S. and Europe realize that these dealers, distributors, retailers and systems houses (all ISOs) must be key factors in their marketing plans.

During the next few years the number of ISOs - already impressive - will explode. And by 1985 these organizations will be buying and reselling more than \$16 billion worth of computers and computer-related products annually.

Computer Business News has always served executives in this third party marketplace, and as the marketplace changes, we're changing with it. Starting in September, we're changing our format and our circulation and expanding our editorial coverage:

NEW FORMAT - "tabazine", tabloid size with four-color glossy covers - color throughout.

ADDITIONAL CONTROLLED CIRCULATION - 30,000 qualified subscribers - including 8,100 retailers, 5,300 dealers, 2,700 distributors/wholesalers, 5,000 systems houses, OEMs, and many others allied to the ISO marketplace.

EXPANDED EDITORIAL COVERAGE - all the new product news, interviews and workshop features, more in-depths, and the most up-to-date information on the ISO marketplace.

READER SERVICE CARDS - this new service gives you an immediate response mechanism for your ads, at no extra cost!

We'll be glad to send you our new brochure with all the details. Just call Tom Casalegno at 800-343-6474. Or fill out the coupon below and mail it in.



Computer Business News

Serving the ISO World

Sales Offices:

BOSTON - Claire E. Wallace - 375 Cochituate Road, Box 880, Framingham, MA 01701 (617) 879-0700

NEW YORK - Brian J. Murphy, Phillip Smith - Paramus Plaza 1, 140 Route 17 North, Paramus, NY 07652 (201) 967-1350

PALO ALTO - Donna Pomponi - 257 Lytton Avenue, Palo Alto, CA 94301 (415) 329-8220

IRVINE - Art Shields, Jill Dondel - Suite 244, 18004 Sky Park Circle, Irvine, CA (714) 754-0187

To: Tom Casalegno
Vice President/
Marketing Director
Box 880, 375 Cochituate Road
Framingham, MA 01701.
Please send me your new brochure
"CBN Expands to Cover the ISO Market"

Name: _____
Title: _____
Company: _____
Address: _____
City: _____ State: _____ Zip: _____

October 18, 1982



Press ESC to exit

You can dump graphics to printer, but you may have difficulty with the printer when you use Screen Print Program.

the double-expansion mode, and the extra shading that is printed improves the appearance of the hard copy.

You must use the specified printers and a monitor that can handle graphics, or the program will not work. The IBM Monochrome Display monitor does not allow for graphics, so you must have access to a monitor that handles graphics. You can, however, print any screen contents that you can view on the IBM Monochrome Display monitor.

The Screen Print Program is a useful utility that makes printing medium- and high-resolution graphics possible and enhances the appearance of printed characters.

EASE OF USE: This program is easy to use once you get your system booted and the selected print-screen program loaded. You can move copies of the various print-screen programs to other disks for convenient loading of the program.

Novice users should have some familiarity with the keyboard and an understanding of the IBM PC operation manual. For example, some micros do not have a PRINT key, and this is an important detail to know since you must press the shift and PRINT keys in order for this utility to work.

The most convenient aspect of this package is the ability to get graphic dumps without having to save the graphic pictures. Getting the desired printout of an animated graphic, however, can be tricky.

ERROR HANDLING: We were able to crash the program when the paper in the printer jammed. The printer immediately stopped, but we had to reboot to get the program running again. There is no way to save your data when this happens.

You get some messages on the screen that help you to run the program and prevent you from making mistakes. You are told when the Print Screen Function is active, when the image will be magnified by two, and when 11-inch-wide paper is required. **DOCUMENTATION:** Four pages of documentation are included, which is sufficient for this program. Some instructions could be more clearly written, though.

There appears to be one error in the manual, which tells you that PRINTSCREEN and MPRTSC90 are normal-size rotated letters. Those versions consistently produced double-size rotated letters when we tested the program.

Overall, the documentation is ade-

quate and serves as a good reference. **SUPPORT:** M.A.P. Systems guarantees the program for 90 days after the date of purchase. During this time, a defective disk will be replaced free of charge. After 90 days, a damaged disk will be replaced for \$7.50.

You can make backup copies of the program with the PC-DOS DISKCOPY Program. Customer support covers any specific problems that you might have.

SUMMARY: The Screen Print Program is a useful utility that enhances the graphic capabilities of your computer. Anyone who uses graphics or double-size letters and needs printed copies will find it useful.



Pronouncing it is the hardest part

Mastering Palantir Word Processing is a snap, if you don't worry about how to say it. If you've never seen a computer before, you'll probably want to step through our relaxed and friendly lessons, just to learn some of the terms. But most of you will just grab the reference guide and begin.

You won't hurt our feelings if you never read the manual. Not that we didn't work awfully hard to make it easy to read and understand. But we worked even harder to make Palantir easy to use without a manual.

Sure, everyone says that their word processor is easy to use; and then when you try it, you wonder what they would consider hard. But we aren't the only ones saying it about Palantir.

In a recent review (80 Micro, September 1982) Palantir was compared to Select[®] and Script[®] 2.0. It was not surprising to us,

anyway that the reviewer, a Script[®] user, found Palantir easiest to learn and to use. (Select was third.) But even we were surprised when our tutorial was also rated highest. We, too, had believed Select's ads about typing "T" for Teach[®].

OK, you say, maybe you do have the easiest word processor, but those others are hard because they can do so much. How do you compare in power to old wordhouses like WordStar[®]?

We thought you'd never ask. The reviewer also said, "Palantir's ease of use is not at the sacrifice of power or efficiency." The man knows his stuff.

And we are proud to announce something the reviewer didn't see. Palantir now has Mailout[®]—a form letter function so simple that real people can use it without calling for the programming staff. Create letters, labels,

reports—repetitive files of all kinds—by adding a few straight-forward commands to handle variables, conditionals and nested files. It even has four-function integer math if you want to get tricky.

The wordhouses can't beat it for power, and they never get near it if you compare usability.

Palantir doesn't cost you an arm and a leg either. You can get Palantir Word Processing with Mailout, not for the \$745 of Word Star with Mail Merge[®], not for the \$595 of Select, but for only \$450. It's not \$29.95, but for the closest thing to a dedicated word processor this side of \$7,000, that's not bad.

Palantir. Ask your dealer for it by name. If he can't pronounce it, we answer to almost anything that begins with "P" that's not a fruit.

Say it again—"Pal-an-TEER." The rest is easy.

Fast Answers to Tough Questions

MICROSOFT MULTIPLAN



Multiplan is the new, advanced-feature electronic worksheet that turns a microcomputer into an answer machine. Multiplan lets you tackle and solve your toughest business questions in a snap. Multiplan—simple, faster, more powerful problem-solving software for non-computer people. From Microsoft, of course.

\$239

standard software

CORPORATION OF AMERICA

10 Mazzeo Drive, Randolph, MA 02368

1-617-963-7220

1-800-343-0852

Hours: Mon-Fri: 8am-8pm, EDT. Sat: 8am-4pm.
Ordering Information: MasterCard, VISA, C.O.D.
3% software discount on prepayment by check.

Microsoft and Multiplan are trademarks of Microsoft Corporation.

Designer Software

HOUSTON

Palantir, Mailout and Designer Software are trademarks of Palantir, Inc.
Wordstar and Mail Merge are trademarks of MicroPro International Corporation. Select and Teach are trademarks of Select Information Systems, Inc. Script is a trademark of Teedy Corporation. Apple, Apple II and Apple III are registered trademarks of Apple Computer, Inc. CP/M is a registered trademark of Digital Research, Inc.

**3400 Montrose Blvd., Suite 718
Houston, Texas 77006
713-520-8221 Telex 790510**

Special Apple[®] Price

Now available on Apple[®] II[®]!

For Apple II[®] or Apple[®] III[®] using CP/M[®], you can buy an *unused* Palantir for only \$350, suggested retail price. Contact your local Apple dealer or have them contact us.

SuperSoft FORTRAN, a new language for CP/M

By Tim Daneluk

FORTRAN (Formula Translator) is a general-purpose scientific and mathematical problem-solving language originally developed by IBM for use on large mainframe computers. While several microcomputer FORTRANs are available, none are as complete as the SuperSoft version for CP/M.

FEATURES: As with most products of this type, you have to enter the source code of the FORTRAN program with a text editor. This package includes no editor of its own, but it works fine with the CP/M editor, ED. Once you have prepared a source file, you invoke the SuperSoft compiler;

which generates a relocatable object module. You then use a loader program to actually create an executable .COM file. If you've never used a compiler before, this may seem like a tedious process but rest assured that such a procedure is perfectly normal with this type of product.

The compiler itself supports the complete ANSI 66 FORTRAN standard. An optional RATFOR preprocessor is also available from SuperSoft. It gives you the flexibility of some of the structuring constructs of ANSI77 FORTRAN, such as REPEAT...UNTIL and WHILE.

One of the nicest aspects of the com-

piler is that it supports the complex data type, which makes it particularly useful to engineers or scientists whose applications typically demand this kind of arithmetic. Aside from the usual complex add, subtract, multiply and divide functions, the package also supports complex sine, cosine, exponentiation, logarithm and square-root operations. One note of warning from the manufacturer explains that errors generated during complex arithmetic can cause undefined results.

The compiler also supports a variety of extensions beyond the ANSI standard FORTRAN. You can compare vari-

ables or literal strings by using any of the arithmetic-comparison operators such as .LT. or .GT. The elements of a DO statement can be constants or arithmetic expressions.

Moreover, SuperSoft FORTRAN lets you use a REAL data type as a loop index; you can also use loops with negative increment values. This too is a feature that can help solve "number crunching" problems prevalent in the physical sciences and mathematics. Subscripts may be arithmetic expressions in this FORTRAN. There is no limit to the number of CONTINUEs in a program, and multiple statement lines are also supported.

We Have It!! At the best prices.

Call For Super Value
On S-100 System With
Dbl. Dens. 8" Drives!

INTERTEC SUPERBRAIN II Fine! MicroSoft Basic 80

Sail contained computer with dual disks and two RS232C ports. Complete with CP/M 2.2.
64K Jt. \$2099
64K QD \$2495
64K SD \$2495
10 Meg. DDS Hard Disk \$2995

VIDEO TERMINALS

SORCQ ID 130 595
SORCQ ID 135 749
SORCQ ID 135G 799
SORCQ ID 140 1149
HAZELTINE ESPIRIT 1149
ESPIRIT II CALL
1420 CALL
1500 CALL
1510 CALL
1520 CALL
TELEVIDEO 910C CALL
912C CALL
914C CALL
925C CALL
950C CALL
TEXAS INSTR. 940 BASIC 1599
940 Package 2079
745 Portable Terminal 1399
745 Portable Terminal w/ U.I. Case 1499
INTERTEC INTERFACE III 749
ZENITH Z 19 729

PRINTERS

ANADIX DP-9500 \$1349
DP-9601 1349
PAPER TRITON IDS 466G Special \$599
PRISM PRINTER IDS 80 w/c color 549
IDS 80 w/c color 549
IDS 132 w/c color 549
NEC 3610, 10K ASCII, 30 cps 1945
NEC 3630 10K Crawl, 30 cps 1945
NEC 710 10K ASCII, 30 cps 2395
NEC 7270 4K ASCII, 30 cps 2999
NEC 730 10K Crawl, 30 cps 2395
OUME Sprint 9 i/c 2395

Let's run & see! RS232C, NEW LOW!
CITRON Pro Writer, Parallel 549
Sears and Roebuck 549
464 549
2299 549
CENTRONICS 730-1, Parallel 349
707-1, RS232C 389
707-1, Parallel 349
704-1, RS232C 1595
1225, Parallel, 120 CPS 949
EPSON 489
MX80 489
MX100 719
MX100T 719
GS252 Serial Interface 65
RS232C 2K Buffer/Interface 125
Griffiths II 125
Lynx Printer Interface 135
1810 Basic, RS232C 1499
1810 Basic, RS232C & Parallel 1499
1810 Full ASCII, vertical format, control compressed print, ... 1595
820 RD, Basic 1495
820 KSR, Basic 1329

All prices, F.O.B. shipping point, subject to change. All offers subject to withdrawal without notice. Advertised prices reflect a 2% cash discount order placed prior to shipment. C.O.D.'s and credit cards are 2% higher.

OKIDATA Microline 80 399
Tractor-feed option 479
Microline 82A 479
Microline 83A 559
Microline 84 PARALLEL 1149
Microline 84 SERIAL 1249

MONITORS

ZENITH ZVM 121, 12" Green Phos. \$125
AMDEK 100, 12" NEW LOW, 95
1000, 12" Green Phosphor 149
300, 12" Green Phos. H. Res. 199
Color 1, 13" 399
Color 12, 13" R.G.B. H. Res. 799
Apple adapt. for R.G.B. 159
BMC 12A, 12" Gr. Phos. New Low 95

NORTH STAR Call For Prices

FLOPPY DISK SYSTEMS
MORROW DESIGNS
Discut 2D, single drive DD 899*
Dual Discut 2D, dual drive DD 1549*
Discut 2, 2" double sided DD 1299*
Dual Discut 2, 2" 2199
Dual DMA Discut 2D 1619*

HARD DISK SUBSYSTEMS
MORROW DESIGNS
Discut M, 5 Meg New Low \$1599*
Discut M 10 10 Meg 3099*
Discut M 26 26 Meg 3799*
CORVUS 5 Meg 1189
10 Meg 4545
20 Meg 5499
KONAN David 5 Meg 3499
10 Meg 3049
15 Meg 3299
INTERTEC 10 Meg SPECIAL \$2995

*Includes CP/M 2.2 and Microsoft Basic.
FLOPPY DISK CONTROLLER
BOARDS
CROMEMCO 18PC DD 1499
NORTH STAR 479
MORROW DD 320, A8T 329
INTERSYSTEMS, FDC 2, A8T 439
TARBELL DD 320, A8T 445
SYSTEMS GROUP DD DMA 439

ESCON CONVERSION FOR IBM SELECTRIC

Complete with microprocessor controller and power supply. Factory built. Use existing assembly or it can be done at ESCON Factory. \$634
Cable for above 25

PROM PROGRAMMERS

SSM PB1 Kit \$152
SSM PB1, A8T 225

MODEMS

NOVATION CAT Acoustic Modem \$149
D.C.A.T. Direct Connect 155
AUTO CAT Auto. Serial 219
APPLE CAT 329
UDS 103 J.P. Direct Connect 175
103 J.P. Auto Answer 329
DC HAYES MICROCOMMOD II (Apple) 329
MODEM 100 (S 100) 329
Smart Modem RS 232C 329
Potomac Micro Magic (S 100) 329

CALIFORNIA COMPUTER SYSTEMS

280 CPU Board \$1269
Disk Controller 2422, w/CP/M 359
16K Static, A8T 259
32K Static, A8T 399
64K Dynamic RAM 675
System 2210 w/ 64K, CP/M 2.2 1746

CPU BOARDS

Identified units only (noted)
NORTHSTAR Z 80A (IPS A/A) \$269
INTERSYSTEMS (IPU 80) 349
SSM CB1 8000 A8T 214
CB2, 2.80, A8T 289
CB2, 2.80, Kit 219
SYSTEMS GROUP 2 80 w/16 I/O 419

MEMORY BOARDS

NORTHSTAR 16K RAM \$299
HRAM 64K 589
HRAM 32K 419
CROMEMCO 18K2 419
CROMEMCO 8K42 595
MEMORY MERCHANT
16K Static, 4MHz 159
64K Static, 4MHz 549

GODROUT (A8T)

CPU Z \$649
CPU 8085 88 359
RAM 20 32 359
RAM 17 84 359
RAM 21 1439
Interface 1 209
Disk 1 419
System Support 1 325
Enclosure 2 (Desk) 699
Enclosure 2 (Rack) 759

VIDEO BOARDS I/O Mapped

SD SYSTEMS
VB8-8024, A8T \$469
SSM VB210, Kit 169
VB10, A8T 225

MEMORY MAPPED

VB1C, 16K4, Kit 152
VB1C, 16K4, A8T 152
VB3, 80 Char 4MHz, Kit 359
VB3, 80 Char 4MHz, A8T 419

APPLE BOARDS

CALIFORNIA COMPUTER
7710A Asynchronous Ser. Interface \$129
7712A Synchronous Ser. Interface 105
7424A Calendar Clock 95
7728A Centronics Printer Interface 95

MicroPro WordStar, SpellStar, MailMerge.

Lit. #886 - Special, \$399.
(Includes formats only)

MicroPro DataStar, CalcStar, SuperStar. Lit. #887 Only \$399

(Includes formats only)

SuperCalc, . . . \$179

(Includes formats only)
- Limited Supply, Limited Time -

InfoWorld Software Report Card

SuperSoft FORTRAN

	Poor	Fair	Good	Excellent
Performance	☐	☐	☒	☐
Documentation	☐	☒	☐	☐
Ease of Use	☐	☒	☐	☐
Error Handling	☐	☒	☐	☐

System Requirements

- CP/M-compatible system
- CP/M
- One disk drive

Price: \$275

SuperSoft

P.O. Box 1628
Champaign, IL 61820

A final indication of interest lets you increase or decrease the value of a variable directly, with the INCREMENT and DECREMENT statements. It provides more efficient run-time code from the compiler.

When you invoke it, the compiler gives you several options or compiler "switches" in the command line. You may choose to generate a source listing and statement/variable map to either the list device or a disk file.

You can also do trial compilations by setting a switch to suppress the generation of object code. In this case, the source file is still compiled, but no resulting object file is created. You can use a switch that forces a new physical page on the list device whenever a new subprogram is listed. Finally, you can have the compiler output the object code in hexadecimal characters instead of true binary.

Once the compiler has created a binary object file, you use a special linking loader to create the final executable .COM file. The object code the compiler creates is in a relocatable format. You use the linking loader to set the actual execution address of the final program and to search through libraries of predefined FORTRAN func-

See FORTRAN, page 52

MiniMicroMart, Inc.

943 W. Genesee St. P.O. Box 2991 Syracuse, N.Y. 13220 (315) 422-4467 TWX 710-542-0431

Rapid Access Marketplace

HARDWARE MANUFACTURING

HEWLETT-PACKARD
1001 N. Circle Blvd.
Corvallis, OR 97330 (503) 757-2000
 Hewlett-Packard Series 80 personal computers:
 one-on-one computing solutions

SYSTEMS GROUP CO.
Subsidiary of Measurement Systems & Controls
1801 Orangewood Ave.
Orange, CA 92668 (714) 833-4400
 Systems & I/O systems & board level products
 for a single & multiuser systems w/hard disk &
 tape.

PARA DYNAMICS CORP.
7895 E. Appleton Ave.
Scottsdale, AZ 85260 (602) 991-1600
 S-100 Bus Micro Computer Main-Frame
 8" Disk Drive Cabinets, Integrated 5 1/4" & 8"
 Main-Frame Data Drive Interfaces

INSURANCE

SAFEMATE The Computer Insurance
Company of National General Agency
88 East Broad St.
Columbus, OH 43215 (606) 848-2666
 In Ohio (614) 224-7325

Is your personal computer protected by home
owners policies because it has business value?
 Call SAFEMATE. Specialists in computers and
 the computer industry.

INVENTORY CONTROL

NATIONAL COMPUTER WORKS INC.
347 Claver Blvd.
Dallas, TX 75219 (214) 825-5747
 Plays the ROL, CA 8001 (214) 825-5747
 B&B CODE SPECIALISTS: We build & sell B&B
 Code systems for all applications. Lumber, stone,
 shoe stores, small markets, Fast Food, Veteri-
 narians, etc. Full systems for less than \$2000.

MAIL ORDER

THE CPU SHOP
420-434 Rutherford Ave.
Chickadee, MA 02129 (617) 243-3361
 Microcomputers, hardware & software for busi-
 ness and personal applications. Low prices.
 Prompt delivery. Send for free catalog.

NEW ERA TECHNOLOGIES, INC.
2525 Ely St. NW, Box 982
Baltimore, MD 20906 (301) 668-5767
 Hardware, Software & Supplies. Wide selection,
 low prices, fast delivery. Call toll free for prices,
 MC-VISA.

MANUFACTURERS REPS

JAYCOE CORPORATION
827 South Lullin St.
Chicago, IL 60607 (312) 738-1105
 Serving many computer dealers, distributors,
 consultants in Illinois, Indiana & Wisconsin.
 Working with mass marketers. No conflicting
 lines.

MEDICAL

PROFESSIONAL SYSTEM CORPORATION
3686 Carson, Suite 220
Torrance, CA 90503 (310) 216-5345
 The Physicians Office Computer. The only sys-
 tem with a track record. Automatically produces
 insurance forms, laboratory forms, day sheets,
 patient lists, ledger & much more. Mail or write
 for brochure, your local dealer or visit list.
 CP/M

MEDICAL NETWORK

PACIFIC MEDICAL
BULLETIN BOARD SYSTEMS
1011 N. Currier Ave.
Salt Lake City, UT 84103 (801) 552-1739
 SINE (Computer Address NUMBER)
 Medical Telecomputing & Telecommunications
 directed to ALL members of the Medical and All
 Health Health Professionals. Including BUT NOT
 LIMITED TO:
 Physicians, Nurses, Dentists, Pharmacists,
 Paramedics, Psychologists, Medical Records,
 Physical Therapists, Nursing students, EMT's, &
 Medical Engineers, etc.

PERIPHERALS

ARLON, INC.
1710 University Ave.
Walpole, MA 04806 (603) 726-1126
 RAMDISK® 320K Memory System for Apple II
 2.8 - RAMDISK® 128K Memory System for Atari
 800, RAMACAM® 32K Memory Module 400/600.
 S&T TECHNOLOGICAL ASSOCIATES, INC.
 St. Louis, MO 63103 (314) 487-4231
 EASY PROGRAMMER: RS232 serial interface to
 computer & terminal. POWER MODEM™ -
 RS232 communications over AC powerline.

RE ELECTRONICS, APPLE II PRODUCTS
568 Union
Burlington, CA 94207 (916) 686-2047
 Super FunKit: CPU, exhaust fan & special power
 switch w/AC outlet. Super RAM's: 16K, 32K
 11/23/81 \$140.

PERIPHERALS/TYPESETTING

CYBERTEXT CORPORATION
1695 Louis St., Box 480
Alaska, CA 95521 (707) 832-7078
 Interface microcomputers word processors di-
 rectly to photo typesetting equipment with mi-
 croCOMPOSE™. Publication quality hard copy.

POWER PROTECTION

CUESTA SYSTEMS, INC.
3440 Roberts Ct.
San Luis Obispo, CA 93401 (805) 541-1480
 DATAWARE® power backup unit in 30 & 200
 watt capacities provide uninterrupted AC
 power. Transient overvoltage protection insures
 in DATAWARE available separately in the Voltage
 Surge & Transient Suppressor.

COMPUTER POWER SYSTEMS, INC.
6901 Wynne Ave.
Princeton, NJ 08118 (212) 643-7433
 In N.J. (609) 772-0023 in N.J.

The Micro Power Center is a power backup sys-
 tem from 1 amp. to 40 amp. providing uninterru-
 pted AC power load regulators. Filters both in-
 put & out-put, solid state, 90% efficient, low
 harmonic distortion.

DATES INCORPORATED
1658 Denbury
Baites, TX 76214 (214) 361-4415
 UNIVERSAL BATTERY POWER SYSTEM.
 Backs up 1 to 1.5 VDC computer power supply
 for 4 hours, 10 nonessential switch time, easy in-
 stallation - \$346.

PROFESSIONAL BILLING SYSTEMS

BILLMATE®
by ADVANCED SOLUTIONS, INC.
Two Oakwood Terrace, Suite 210
Sunnyvale, CA 94086 (408) 730-4688
 Lawyers, doctors - simple, easy to use appli-
 cations. Balance forward accounts for accurate
 statements. CP/M, MP/M compatible 48K or
 64K, up to 500 entries. Priced \$395. Dealer in-
 quires welcomed.

PRINTERS

THE PRINTER WORKS
2273-A Glenview Ave.
Hayward, CA 94545 (415) 887-4116
 Refurbished Dataquest Peripherals 1620
 209 9159, 1650 1015 \$1499. 32-directional
 format printers \$135. Spare parts and services avail-
 able.

PUBLICATIONS/GAMES

COMPUTER GAMING WORLD
P.O. Box 8203
Anaheim, CA 92805 (714) 776-4879
 A bi-mo. mag covering the computer gaming
 hobby. Dealers & simple, easy to use appli-
 cations. Balance forward accounts for accurate
 statements. CP/M, MP/M compatible 48K or
 64K, up to 500 entries. Priced \$395. Dealer in-
 quires welcomed.

PUBLICATIONS/NEWSLETTERS

PERIODICAL GUIDE FOR COMPUTERS
P.O. Box 286-1
Applegate, OR 97330 (503) 846-4742
 INDEXES: articles from 150+ computer maga-
 zines. Beginning 1977-78 to 1978, \$5.00 each
 1980-81 index, \$15.00 p.p.

COMPUTER INDEX®
2444 St. Camino Real, Suite 247
Santa Clara, CA 95051 (408) 664-1097
 Lists with abstracts (article summaries) for 32
 magazines. Published quarterly, 1700 citations per
 issue, \$30. per year. Available online on-line.

MICRO QP
Software Buying Cooperative
P.O. Box 714
Chicopee, MA 01014 (313) 232-1777
 Bi-monthly QP on newsletter contains reviews
 of current software products, members can pur-
 chase software at reduced prices. Summary of
 future for Apple, Atari & Others to be supported
 in future. Write or call for information.

PC: THE INDEPENDENT GUIDE TO IBM PERSONAL COMPUTERS
Software Communications Inc.
1528 Union St.
San Francisco, CA 94132 (415) 783-8088
 IBM Personal Computer users find this guide
 provides applications information and
 answers in PC magazine. To subscribe,
 send \$14.95 for 60 issues or \$27 for twelve
 (12) issues.

Q-U-S JOURNAL
3838 South Warner St.
Tacoma, WA 98408 (206) 475-2219
 TNS-80 USER'S JOURNAL, a monthly magazine
 that supports the entire line of Tandy Com-
 puters. Programs, listings, hardware & software
 reviews, news & new product announcements.
 Only \$19.97 for C&M, Mac, \$25.00, inc. \$72

Q-Tech
P.O. Box 517
Clearwater, FL 33517 (813) 446-7328
 A HOW-TO, WHAT-TO, WHERE-TO newsletter
 for the beginner & experienced users of the
 Osborne I computer. A reference guide for to-
 day & tomorrow. Sample \$10. 6 issues per yr.
 \$8.00 international rates

ADTRAC, INC.
1801 Old Middlefield Way
Mountain View, CA 94043 (415) 965-7473
 Software & data of specific, experienced and market
 share in over 30 computer publications. Used by
 managers, publishers, spice reader, media
 buyers. Call for complimentary literature.

PUBLICATIONS/SOFTWARE PROTECTION

LAWS & TECHNOLOGY PRESS
3500 E. Figueroa Street #211
Los Angeles, CA 90007 (213) 748-3416
 SOFTWARE PROTECTION: the only publica-
 tion written for both lawyers & non-lawyers fo-
 cusing solely on legal & technical aspects of
 protecting computer software. \$48 for 8 issues.
 International \$80. Sample copies \$2.50

REPAIR

NORTHEAST COMPUTER REPAIR
16 Mazzeo Dr. 8202
Randolph, MA 02881 (617) 943-5400
 Repairs: PERIPHA, Excess, INC, Diablo, Oki,
 data, Qume, Chicom, Smith-Corona, COMPUTER
 REPAIR, IBM, Kenex, Altair, Interphase,
 and more. For new product lines. Service con-
 tract available. MASS, R.I. N.H.

SALES LEADS

COMPUTER INFORMATION
3344 N. Torrey Pines Ct., Box 210
La Jolla, CA 92037 (619) 504-1887
 Monthly detail on recent buyers of computa-
 tion (as far as many) products. Use electronic
 typewriter. Name names monthly - over 100,000
 sites on lists.

SEARCH FIRMS

EXETER ASSOCIATES
P.O. Box 622, Computer Park
Hempstead, NY 03642 (800) 256-7328
 Telecommunications-software-applications
 engineering, Networks and overviews.

68000 HARD/SOFTWARE DEVELOPMENT SERV.

RHYTHM SOFTWARE, INC.
P.O. Box 11105
San Francisco, CA 94101 (415) 750-7448
 We have the 68000 hardware & software. We
 write operating systems, applications &
 translate Source From 2-40, 68000 to 68K.
 On-site, turn-key, hourly or per line.

GREEN HILLS SOFTWARE
280 West Green St.
Pasadena, CA 91105 (313) 798-4543
 PL/M-8000: Fast, globally optimizing compiler
 for the EBCDIC systems. Upward compatible
 w/PL/M-68.

SOFTWARE/AGRICULTURE

COUNTRYDATA, INC.
718 North Main St., Suite 201
Idaho Falls, ID 83402 (208) 528-5758
 Available for most models UCSD PASCAL & C/P
 M8C systems for accounting, financial, dairy
 herd program. Detail list. Dealers inquiries in-
 cluded. UCSD-PASCAL trademark, Regents of U.
 of C. M. trademark of Digital Research, Inc.

RED WING BUSINESS SYSTEMS, INC.
810 Main St.
Red Wing, MN 55068 (612) 386-1106
 WORKING RECORDS™ Software for use
 farm. Inventory, accounting, financial, dairy
 herd, inventory, needs in the line of U/L, A/P, R/
 I, monthly, assets management, tax planning,
 etc. Designed by a professional, 32,000 lines of
 data processing. Available for TNS-80, Apple,
 and IBM PC.

GRITTS DATA SERVICES

5410 Prospect
Pawnee, IL 61871 (309) 686-1055
 FACS, Farm Accounting Control System, Full,
 single-entry, cash-basis accounting for Apple,
 Osborne, Tandy, FACS to your operation. Also a
 group, handy & flexible. Dealer inquiries in-
 cluded. Get the facts on FACS.

FBS SYSTEMS, INC.
P.O. Box 201
Altoona, IL 61711 (309) 585-5629
 SECRETARY OF AGRICULTURE - Integrated fi-
 nancial, crop and livestock records. TNS-80,
 Apple, CP/M - Free "Trinity Farm Computer
 Newsletter" - Dealer inquiry.

AGRICULTURAL SOFTWARE CORPORATION
1706 Santa Fe
Kingville, TX 75603 (313) 595-1837
 CP/M & TNS-80 - Universal farm record-
 keeping program. Stores hundreds of ingredients
 with 57 nutrients, 350s, demo disk & manual
 \$14.95 MINIMAX, solves 50 to 50 and other farm
 planning problems. \$200.

AG DATA SYSTEMS™
601 Hazel St.
Orlando, CA 95848 (818) 846-8203
 A type of computer software for agriculture.
 Full disk entry, G/L, P/R & cost coding. Coming
 can be by field and/or crop & by equipment
 operator. Auditing details are maintained in
 yr. reports & inventory analysis. Land leveling
 grower-packer, farm mgmt. co., huffer &
 other programs also available. Dealer inquiries
 welcome.

SOFTWARE/AGRICULTURAL BUSINESS

DECISIONDATA & SERVICES INC.
113 Kellogg Ave.
Ames, IA 50010 (515) 223-4873
 Agriculture & banking software for Apple.
 Farm management programs: Beef Feedlot,
 Least Cost Feeds, Commodity Chart Manager,
 Crop Manager, Buy, Sell, Lease, Deferment,
 Farm Decision Audit, Banking program, In-
 Trust Accounts, Loan Profitability, IRA propo-
 sitions. Ask for info. Invited.

SOFTWARE/BUSINESS

INSOFT
10175 N. W. Barbur Blvd.
Portland, OR 97201 (503) 244-4181
 Invoicing, Accounts, General Ledger, Accounts
 Receivable, Accounts Payable and Payroll.

PEACHTREE SOFTWARE
3 Corporate Square, Suite 700
Atlanta, GA 30328 (404) 329-8533
 Complete line of accounting packages and
 Magic Wand™ for CP/M micros.

MICRO PRO™ INTL. CORPORATION
1299 Fourth St.
San Rafael, CA 94601 (415) 427-6800
 A powerful family of programs, that work to-
 gether, including WordPerfect™, dBase™, Cal-
 culator™, SpellMaster™. SOFTWARE THAT MEANS
 BUSINESS.

T.C.B. SOFTWARE
3206 Fordham
Houston, TX 77063 (713) 977-7908
 Includes CLIENT LEDGER SYSTEM and
 TOTAL ACCOUNTING SYSTEM (Demo disks
 included). Write or for more information.

TAFT & ASSOC., INC.
121 Park St.
San Rafael, CA 94603 (415) 476-2070
 Complete Integrated accounting system for
 the TNS-80 & CP/M based SYSTEMS.

MICROCOMPUTER CONSULTANTS
P.O. Box T
Davis, CA 95617 (916) 756-0154
 (Outside California)
 A broad line of accounting packages designed
 for the first time. Run on CP/M™ or MP/M™.
 Written in PL-B. Demo disks available.

PERFORM CORPORATION
7 Erie Dr.
Meriden, CT 07060 (617) 865-2400
 State of the art business software. Over 20
 accounting capabilities operating under CP/M for
 286 systems. Includes A/R, A/P, Inventory, G/L,
 & Inventory, Clear, concise manual. Demo disk
 available.

MICRO COUNSEL CORPORATION
1444 Gary Blvd., Suite 300
San Francisco, CA 94114 (415) 751-6223
 Professional training for industry. Complete in-
 structural system. Includes: educational in-
 structional system, financial statement analysis,
 service & maintenance. Current software, data
 service, and IBM PC.

SOFTWARE SYSTEMS SPECIALISTS

124 Chemical Lane
Salem, NH 03071 (603) 798-0988
 24 HOUR SERVICE & TECHNICAL SUPPORT for
 a complete line of general accounting, accounts
 receivable/payable for CP/M computers. W. P.
 for IBM-Demo disk available.

SOFTWARE DIMENSIONS
6371 Auburn Blvd.
Citrus Heights, CA 95610 (916) 722-8000
 Sales & service for IBM, Apple, Tandy, and
 business accounting systems of ACCOUNTING
 PLUS, ACCOUNTING PLUS II, and CPA PART-
 ners.

CHUCK ATKINSON PROGRAMS
1000 N. 1st St.
Bartlett, TX 76188 (817) 854-2011
 Micro Management Systems. For individual,
 business or professional. CP/M (IBM), Guide
 \$2.95. Disk prices start at \$16.85

SOFTWARE/BUSINESS MANAGEMENT

Mr. Danny L.H. President
1675 Century Park East, Suite 1700
Los Angeles, CA 90024 (313) 879-8911
 Business Management Systems: Financial data-
 bases, sales vs. buy, statistics, real estate,
 economics, financial statement analysis, in-
 vestment planning, etc. TRSDOS & CP/M. Con-
 sulting and programming available.

SOFTWARE/COLLEGE FINANCIAL AID

SOFTWARE CREATIONS
10720 S. Howe
Irving, CA 90044 (313) 754-4431
 Three new software packages: NDSI, BILLING-
 INDEPENDENCE ACCOUNTING AND STUDENT
 PROLOG. Ask about our CUSTOM program.

SOFTWARE/CONSTRUCTION

CONSTRUCTION DATA CONTROL, INC.
3000 Vienna Rd.
Baltimore, MD 21204 (410) 534-4722
 Accounting, Estimating, Job Cost, Variable
 Rate Control - Payroll - Div. Inv. Invited.

SOFTWARE/COMMUNICATIONS

MICROBIT, INC.
1000 Leland Dr., Suite 12
Marina, CA 90401 (415) 862-0287
 Crosstalk™ shows your system to communicate
 and exchange files with other dial-up systems.
 Remote™ - open systems from remote termi-
 nals.

WINTERHALTER & ASSOCIATES, INC.
113 North First St.
Ann Arbor, MI 48103 (313) 962-3002
 Communication Software to interface micro
 systems to mainframe computers, written "C". IBM
 3780, IBM 2760, IBM 2770, IBM 3471, IBM 3375,
 & IBM 3278 available. X.25 and SDLC/SDNA in
 development and available to OEM and man-
 ufacturers.

IE SYSTEMS, INC.
Box 258, 66 Main St.
Newark, NJ 08107 (800) 850-5881
 As the exclusive U.S.A. distributor for Micro-
 Informatik, it now offers the most comprehen-
 sive selection of communication software for
 IBM & PC personal computers available today.
 ASYNC for error-free transmissions to DEC™ ver-
 sion-10.20, PDF-11 and VAX. IBM-3750 for IBM
 3780, 2760, 2770, and VAX. IBM-3070 for 3070/
 3275, 3278 and IBM-3445 for IBM main-
 framing workstation available. Networking com-
 patible: SDLC 3270 and 3770 versions

SOFTWARE CP/M

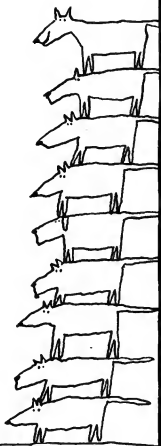
STANDARD SOFTWARE CORPORATION
OF AMERICA
10 Mazzeo Dr., 8208
Randolph, MA 02881 (617) 943-7220
 Micro-8000 & High-capacity capacities. Over
 300 applications in stock at discount prices.
 Over 20 name brands of hardware available at
 discount.

SOFTWARE/CP/M & TURBODOS COMPATIBLE

SMITH MICRO ENTERPRISES
303 Mercurio Bldg.
Meriden, CT 07060 (617) 235-7514
 Dealers of the CP/M computer, software, designer
 Software/MicroPro/MiniPro/ProView &
 Micro, MC 80786 We have Q/L, A/P, R/
 P, P/R, F/A, W/P, S/D, Tax, Comm, D/B, M/M,
 P/M & more.

InfoWorld 49

Unabashed joy at being top dog.



There's a lot of different software being sold these days, some selling more than others.

In the past year, MicroPro software systems have consistently been named top 10 best sellers for business software in computer stores around the country, according to *Computer Merchandising* magazine.

These systems include the WordStar®, MailMerge™ and SpellStar™ word processing packages which can save you a good deal of time when you prepare documents and reports, and the DataStar™ and CalcStar™ packages which help you access files instantly and do financial forecasting in minutes.

All of them run on most all microcomputer systems. Meaning when you choose software for your computer, there's no reason to settle for anything less than the best.



The Microcomputer Software Company

5 + 12 e

Apple

Comsoft's PhotoCaster photography system is now available for the Apple II. The program lets you take color and black-and-white photos with a standard TV camera, and then send the photos to another Apple over the phone lines using a self-contained modem. You can send and receive photos in eight seconds; you can also add titles and graphics to the photos and create special video effects.

Black-and-white photos have 16 levels of gray. Color photos have 8 colors, with 16 saturation levels. You need an Apple II or II Plus with 48K of RAM and one disk drive.

PhotoCaster comes with and without a TV camera. Model PC-100 includes an interface for a TV camera, an optional telephone coupler to the Apple, a 100-page manual, two diskettes and a demo cassette tape.

Model PC-101 comes with all that plus a Panasonic WV-1400 TV camera (or the equivalent), cable and RGB (red-green-blue) color-filter accessory. The PC-100 costs \$499.95; the PC-101 is \$749.95. Comsoft, 665 Maybell Avenue, Palo Alto, CA 94306.

The Clinton-Essex-Franklin Library System of Plattsburgh, New York, is offering a Catalog Card and Label Printing program for other libraries that have an Apple II. The program prints out complete sets of catalog cards as well as labels for the pocket, card and spine of library books. You can get all these labels within seconds, after you type the first card into the microcomputer.

You need a 64K Apple II Plus with disk drive and a Videx Videoterm 80-column board and Videx keyboard enhancer. You also need a Microsoft Softcard and an Epson dot-matrix printer. The cost is \$50. C-E-F Library System, 17 Oak Street, Plattsburgh, New York 12601.

Graphic language note: Gra-



BEYOND WORD PROCESSING

Add COLOR, style, imagination and interest to LABELS, LETTERS, PROMOTIONAL MAILINGS, MENUS, WINE LISTS, ANYTHING!

COLORTEXT combines with the fabulous PRISM printer from Integral Data Systems, any text editor or word processor and any CP/M computer to enable printing in:

- red, orange, yellow, green, blue, violet, brown, black
- 8 type sizes (5, 8, 10, 12, 16, 24 CPI)
- correspondence quality
- special foreign language characters
- subscript, superscript and micro-spacing
- ALL OF THE ABOVE ON THE SAME LINE!

COLORTEXT enables you to access these unique capabilities WITHOUT PROGRAMMING by interpreting 33 special commands which you include in your text files.

COLORTEXT is a very easy to learn and use, is available in most CP/M formats and costs \$79.00.

COLORTEXT, IBM PRISM Printers, and complete systems are available from:
Jupiter Island Corporation
1900 Powell Street Suite 1135
Emeryville CA 94608
(415) 655-0540

Wine professionals can use some very special systems available for wine inventory and wine list printing.

FORTH, the Apple graphics language, now supports the Hewlett-Packard 7470 printer; you can get 3-D graphics plotting and multiple character sets and sizes. Insoft, Inc., 10175 SW Barbur Blvd., Suite 202B, Portland, OR 97219.

Insys has created a huge program on two floppy disks that will almost turn your Apple II Plus or Apple III into a micro New York Stock Exchange. Micro-Scan lets you create an investment data base covering 1400 publicly held companies and 88 industries. The program also lets you screen, sort and rank companies in the data base in seconds and print out investment and portfolio analysis reports.

According to Insys, the package enables "investors, pension fund execu-

tives, stockbrokers and mergers & acquisition analysts to instantly screen 1400 stocks and 88 industries using any combination of the 26 financial variables in the data base to look for 'buy' or 'sell' ideas, perform stock valuation studies on industries or on portfolios, play 'what-if' games with investment criteria."

The cost is \$3600 per year, which includes the program plus an updated Ford 1400 data base on two new diskettes each month for 12 months. Insys Corporation, 50 Church Street, Fourth Floor, Cambridge, MA 02138.

Other

Condor Computer has developed a relational data-base system that is

now being distributed through Hewlett-Packard's HP Plus program. The HP-125 version of the Condor data-base program gives you speed and use of the computer's screen-labeled "soft keys" and editing keys. The package has been modified to be compatible with the HPWord word-processing program and the HP-Graphics software.

Condor comes in a basic version (20-1) and an advanced version (20-2). The Condor 20-1 package costs \$295; the Condor 20-2 is \$595. Call your local Hewlett-Packard sales office.

Lifeboat Associates and Otrona reached an agreement that makes the entire catalog of Lifeboat software

See Other, page 54

NOW: A COMPLETE CP/M PASCAL FOR ONLY

\$29.95!

HERE'S THE PASCAL YOU'VE BEEN READING ABOUT. AND, WITHOUT EXCEPTION, THE REVIEWS CALL JRT PASCAL A SUPER PRODUCT FOR AN AMAZING PRICE!

InfoWorld
Software Report Card

JRT Pascal
Version
2.0

Performance	☐	☐	☐	☐
Documentation	☐	☐	☐	☐
Ease of Use	☐	☐	☐	☐
Error Handling	☐	☐	☐	☐

Poor Fair Good Excellent

Copyright © 1982 by Popular Computing/Inc. Reprinted from InfoWorld.

So how can we make this offer?—why the unbelievable deal? Very simply, we think all software is overpriced. We want to build volume with the booming CP/M market, and our overhead is low, so we're passing the savings on to you.

AND AT NO RISK!

When you receive JRT Pascal, look it over, check it out. We invite you to compare it with other systems costing ten times as much. If you're not completely satisfied, return the system—with the sealed diskette unopened—within 30 days and your money will be refunded in full. THAT'S RIGHT—COMPLETE SATISFACTION GUARANTEED OR YOUR MONEY BACK!

In addition, if you want to copy the diskette or manual—go long as it's not for resale—it's o.k. with us. Pass it on to your friends! BUT ACT TODAY—DON'T DELAY ENJOYING PASCAL'S ADVANTAGES—AT \$29.95, THERE'S NO REASON TO WAIT!



Send to
JRT SYSTEMS
1891—23rd Avenue
San Francisco, CA 94122

Phone
415/566-5100

O.K. You've sold me. Send me JRT Pascal, I understand that if I'm not completely satisfied, I can return it within 30 days—with the sealed diskette unopened—for a full refund.
(Please allow 2-3 weeks for delivery.)

Goodbye BASIC, PL/I, COBOL—hello PASCAL! Now, to make this most advanced language available to more micro users, we've cut our price—to an amazing \$29.95! This astonishing price includes the complete JRT Pascal system on diskette and the new, comprehensive user manual. Not a subset, it's a complete Pascal for CP/M. Check the features below.

THIS IS THE SAME SYSTEM WE SOLD FOR \$295!

Random files to 8 megabytes with variable length records
64K dynamic strings
Activity analyzer prints program use histogram
Extended CASE statement
Graphing procedures
Statistic procedures

True dynamic storage
Advanced assembler interface

Feet one-step compiler; no link needed
Efficient compiler needs only 85K diskette space
Maximum program size more than 200,000 lines
More than 200 verbal error messages
Separate compilation of auto-loading external procedures
No limits on procedure size, nesting, or recursion

14 digit BCD FLOATING POINT arithmetic

I need the 5 1/4" diskette for ☐ Northstar ☐ Osborne ☐ Apple-CP/M ☐ Heath, Hard Sector ☐ Heath, Soft Sector ☐ Superbrain.
I need the ☐ 8" 5DD diskette.

Name _____ Address _____

City _____

State _____ Zip _____

☐ Check ☐ C.O.D. ☐ MasterCard ☐ VISA
(CA residents add sales tax. Add \$6 for shipping outside North America.)

Card # _____ Exp. _____

Signature _____

*CP/M is a Digital Research TM. A 64K CP/M system is required.

Other

continued from preceding page
available to run on the Otrona Attache portable computer. Programs immediately available in the double-sided, double-density 5¼-inch disk format that the Otrona requires include **Boss Financial Accounting System**, **PMATE II**, **Sales Pro**, and **T/Maker II**. Contact either company for more information. Lifeboat Associates, 1651 Third Avenue, New York, NY 10028. Otrona Corporation, 4755 Walnut Street, Boulder, CO 80301.

Integrated Computer Systems is offering a **course in real-time programming** for control applications written in BASIC. The self-study

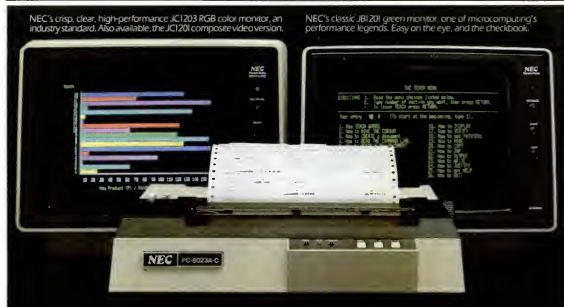


Student at left uses Real-Time Programming in BASIC, a practical hands-on self-study course.

course offers hands-on experience with its (supplied) BASIC Training System, which includes Microsoft BASIC in firmware, 6K of additional RAM for your system, two software-configurable ports and cabling for connecting the system to standard RS-232 terminals and printers.

The course and materials cost \$545. Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, CA 90405.

InfoWorld is unable to test every product announced in this section. All claims attributed to the products have been made by manufacturers or by firms marketing these items.



NEC's crisp, clear, high-performance JC1203 RGB color monitor, an industry standard. Also available, the JC1201 composite video version.

NEC's classic JB1201 green monitor, one of microcomputing's performance legends. Easy on the eye, and the checkbook.

Our impressive new NEC dot matrix printer. Parallel interface, 100 cps, 2K buffer, pin or friction feed. Stunning performance and compatibility in the hottest new peripheral of the year.

Give your IBM system some NEC, and watch its performance soar.

Peripherals from NEC can make almost any computer system better.

Our sparkling new JC1203 color monitor is plug and pin compatible with the 16-color IBM® PC, and delivers the bright, sharp, clear, and stable screen image for which the entire NEC line has long been famous. Similar compatibility is available to owners of Apple II®, Radio

Shack®, and Atari® computers, not to mention our own outstanding NEC PC-8000 series. Also available is a brand new, extremely low cost, NEC green monochrome monitor, the JB1260, perfect companion for an Osborne®, for instance.

Ask your dealer for a demonstration. Or write us at 1401 Estes Avenue, Elk Grove Village, IL 60007.



Productivity
at your fingertips™

NEC

NEC Home Electronics (U.S.A.), Inc.
Personal Computer Division

Nippon Electric Co., Ltd., Tokyo, Japan

Best prices anywhere We beat 'em all!

—COMPUTERS—

ALTOS—List..... Less 20%
NorthStar HORIZON HRZ-2-OD..... \$2885

ADVANTAGE..... \$2285

TeleVideo Computer Systems..... Call

SUPERBRAIN 84K DD..... 1995

84K OD..... 2285

D85-10 Meg. H.D..... 2895

CROMEMCO CS-1..... 3195

CS-2..... 3649

CS-3..... 5895

Z-2H..... 7995

ZENITH z-90 w/Drive..... 2299

Z-88..... 2099

—TERMINALS—

TeleVideo 910C..... 699

912C..... 699

925..... 719

950..... 915

OKIDATA Microline 82A..... 489

Microline 83A..... 739

Microline 94 Per. w/Par..... Call

C.ITOH..... Call for Prices

SOROC IQ-130..... 695

IQ-135..... 719

IQ-140..... 995

HAZELTINE 1420..... 695

1500..... 845

1510..... 1029

ESPIRIT..... 895

ESPIRIT-II..... Call

ZENITH Z18..... 899

—PRINTERS—

CENTRONICS 738-1 (parallel)..... 499

738-3 (RS232C)..... 699

704-11 (parallel)..... 1549

704-9 (RS232C)..... 1519

TI 810 Basic..... 1289

810 Full..... 1549

820 PO Basic..... 1549

NEC 7710 (w/232)..... 2295

Call..... 3510

QUME 8-45 Full Option..... 2125

8-45 Limited..... 1949

DIABLE 630 RO..... 2949

PRISM 80..... Call

132 w/option..... Call

Epson MX-80 FT w/option..... 549

MX-100 w/option..... 745

—DISK SYSTEMS—

MORROW Discus 2D..... 635

Dual Discus 2D..... 1395

Discus 2+2..... 1089

ME, 8Meg. Hard Disk..... 1949

M10, 10 Meg. H.D..... 2995

M28, 28 Meg. H.D..... 3349

Decision I..... 1329

CORVUS 5 Meg. Hard Disk..... 2095

10 Meg. Hard Disk..... 2695

20 Meg. Hard Disk..... 4795

Prices are for prepaid orders only, and reflect a cash discount. Charge card orders are slightly higher.

**Computers
Wholesale**

Box 91 Brewerton, N.Y. 13029

315-472-3055

that items in stock be immediately delivery. Factory sealed orders, or full refund within 30 days. Refund includes shipping. Price does not include shipping. C.O.D. orders require 25% deposit. Prices subject to change without notice.

TI-99/4A, TI's second-generation 16-bit micro

By Lawrence R. De Rusha, Jr.

Other home-computer manufacturers were relieved when Texas Instruments, well known as a manufacturer of semiconductor devices, stumbled into the market in 1980 with the ill-fated TI-99/4, a 16-bit home computer. Its calculator-style keyboard was as unpopular as the "train" of peripheral devices that trailed off the right side of the console for almost five feet.

Many of the problems that critics had complained about on the 99/4 have been corrected on the new computer, the 99/4A. TI released the 99/4A in late 1981 with a new typewriter-

upgraded from the 99/4's TMS9918.

The new processor provides a higher-resolution display, consisting of 256 horizontal dots and 192 vertical dots. Although the screen is not dot addressable except through assembly-language programming, you can define your own graphics within an 8-by-8 dot matrix.

The computer comes with 16K of read-and-write memory, expandable to 48K with an external RAM. In addition, there is 26K of read-only memory that contains the operating system and the TI BASIC language. The ROM is expandable by up to 36K through plug-in software modules.

The console cabinet has a slot designed to accommodate preprogrammed memory boards in a modular form. When you turn the console on, you get a menu selection of either TI BASIC or the module in the console slot. For example:

```
PRESS 1 TI BASIC
      2 TI INVADERS
```

You can obtain other programming languages, such as Extended BASIC and Assembler, on plug-in ROM modules. Although the plug-in cartridge is the simplest access to a program, the cassette system is almost as easy to use.

The cassette system requires a dual

interface cable and one or two cassette recorders. To load a cassette program, you enter the commands OLD CS1 and press Enter. The computer then displays the instructions for operating the cassette.

Some built-in programming aids make the task of writing a program less tedious. Automatic line numbering is one example. You specify any parameters; a resequence command tells the computer to begin with a line number you specify, and then resequence the line numbers and any increment you specify. This command also resets all references to line numbers that occur

See TI-99/4A, page 56

TI-99/4A

Features of Unit Tested

- TMS 9900 CPU
- 16K RAM
- TI BASIC
- Built-in programming disk
- Sound- and noise-generating chip
- Supports RS-232, plug-in software

Price: \$299 (less \$100 rebate until January 1983)

Texas Instruments, Inc.
P.O. Box 53
Lubbock, TX 79408

style keyboard and internal modifications.

Recently, TI announced a \$100 rebate on the 99/4A, which reduces the price to \$199. The 99/4A is a lot of computer for such a little price.

FEATURES: The most obvious change in the 99/4A over the 99/4 is the keyboard. It is a compact typewriter-style board with 48 keys—fewer keys than most home computers. Many of the keys have more than one function: in some cases, the keys have as many as four functions. For example, one key can generate uppercase and lowercase letters, a control code and a symbol or punctuation mark. This multiple functioning is achieved through three special keys.

You use a designated Function key in combination with another key to perform character deletions, character insertions, line erasures or program breaks. In addition, you can use the function combination to scroll the screen, return to a previous screen or redo a screen when using the preprogrammed plug-in software cartridges.

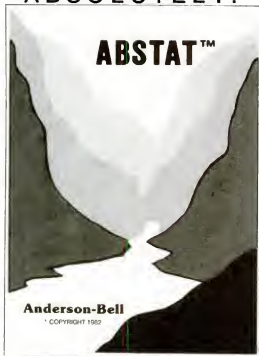
When you press the Control key in combination with another appropriate key, you generate a control code. You use the Control key most often to communicate with remote data banks.

The third special key is the Shift key, which shifts between uppercase and lowercase letters. Since the 99/4 supported only uppercase letters, its Shift key was essentially a function key. Shift-S backspaced, Shift-E scrolled up one line.

The video display is 32 columns wide by 24 lines long. You use an RF modulator to connect a regular television to the computer. Depending on the TV, you may not be able to see the last two columns. The video-display processor on the 99/4A is a TMS9918A,

dBase II users can now evaluate their data quickly and efficiently.

ABSOLUTELY!



Whether you are using dBase II for accounting, inventory control, marketing or scientific applications, ABSTAT provides you with the ability to perform statistical data analysis with ease!

If you are not using dBase II, that's OK because ABSTAT is a stand alone package that can share data with other software through ASCII files.

ABSTAT facilities include full data manipulation and editing, on line help and comprehensive statistical procedures, including analysis of variance, cross tabulation, multiple regression, Z scores and much more.

Prices are only \$395 for the complete package and \$25 for a manual. A complimentary 8" demonstration disk is available on request with the purchase of a manual. Major credit cards accepted.

ABSOLUTELY the most flexible, simple yet comprehensive statistics and data analysis package available for CP/M based computers.

Anderson - Bell

5336 So. Crocker St.
Littleton, CO 80120
(303) 794-7509

ABSTAT is a trademark of Anderson - Bell. CP/M is a trademark of Digital Research. dBase II is a trademark of Ashton Tate.



TI-99/4A: Larger keyboard, no more "train" to worry about

TI-99/4A

continued from preceding page
in any statement throughout the program.

A sound- and noise-generating chip provides many combinations of sounds. In addition to three tones within a five-octave range, the chip can generate six different noises. You specify the frequency, duration and volume of the tones or noises via a Call Sound statement. You can indicate up to three tones and one noise in each Call Sound program statement. The User's Reference Guide charts the frequencies and their musical notation, so you can use your program to produce music.

The peripheral unit on the 99/4 has

aggravated me from the beginning. Each peripheral unit measures about 10 inches long, 6 inches wide and 3 inches high. The units dock into each other. That adds up to a 6-foot train! The system I have can be bumped apart easily. When this happens, the computer locks up and the only way out is to turn the power off! As a result, you lose all your data.

TI is phasing out the "train" of peripherals and is replacing them with a box that accepts peripheral "cards." Disk drives are the only stand-alone peripherals that the system requires. The 99/4A supports the following peripherals: RS-232C interface, up to three disk drives and a controller, 32K CPU memory expansion, speech synthesizer, joysticks and plug-in software.

PERFORMANCE: Although the 99/4A keyboard is an improvement over the old keyboard, you must still take time to hunt for special-function keys. For example, you enter some punctuation marks by pressing the Function key and a letter key; you enter others by pressing the Shift key and a punctuation key.

Also, the Function key is poorly placed, just below the Shift key. This is troublesome if you miss pressing the Shift key and press the Function key instead, look out! The Shift and the "+" key produce a plus (+); the Function and the "=" key reset the computer and erase the contents of the RAM. You lose all data! This was also a problem with the old machine.

I was concerned about the heat generated by the power supply, which is located in the lower right of the cabinet. I tested the console by leaving it on continuously for three days. The power supply was always hot, but the computer had no failures. For my second test, I ran a program that produced prime numbers. It ran continuously for 15 hours. Again, I encountered no problems.

TI BASIC which is resident in the computer, is a slow interpreter BASIC. A program sits and "idles" before it begins. It's somewhat irritating to sit and wait. The program, however, traps programming errors during this idling, and displays an error message indicating the nature of the error.

The console looks fragile, but when I let several children play games on the computer, and they pounded the keys, the keyboard took the abuse rather well.

EASE OF USE: Overall, this is one of the simplest computers I have used. The keyboard, as I mentioned before, is awkward at times. The loading of software and setup are straightforward.

A strip above the keyboard labels some of the special function keys. This is not a good idea, even though it works, because the keyboard is too small in the first place and so the keys are overloaded with operations.

DOCUMENTATION: The documentation for the 99/4A is complete, well written and clear. It includes a Beginner's BASIC book, a User's Reference Guide, addendums, RF modulator instruction sheet, a Read This First pamphlet and a TI BASIC reference (pocket) card. There are no technical manuals for the hobbyist.

The Beginner's BASIC book is written. See TI-99/4A, page 58

Data Technology Industries



SOFTWARE DIVISION

CP/M SOFTWARE

ACCOUNTING

list/ manual	list/ manual	price	system requirements
TCS 5.0 (A/R, A/P, G/L, PR 99/ea)	\$250	\$ 250	1, 9, 11
MUA	500/module	500	1, 4, 9

COMMUNICATIONS

CONFERR	175	175	13
RRE	500/25	500	1, 9

DATA BASE MANAGERS

Condor I	695/35	695	1, 9
Condor II	950/50	950	1, 9
Condor Demo	75	75	1, 9
Demon II	695/50	695	1, 9
PM/80	995	995	1, 9
MDBS	1500/85	1350	1, 4, 9
MDBS I	900	900	1, 9
MDBS II Demo	75	75	1, 9
MDBS II Package	3000/85	3000	1, 4, 9
Quick-Net	395	325	1, 4
TCS Inventory	99	99	1, 9, 11
TM I	300/25	250	1, 11
TM II	695/50	595	1, 3

FINANCIAL MODELING

CalcStar	295/40	250	1, 4, 9
MicroPlan	495	395	1, 9
MiniModel	495/50	495	1, 7, 9
Multiplan	call		
SuperCalc	295	250	1
Target Interchangeable	139	139	1
Target Planner	195/25	195	1
Target Planner Demo	75	75	1
Target Task	329/25	329	1, 3
TMAR	275/25	229	1

IBM PC SOFTWARE

TCS - more to be announced.

SYSTEM REQUIREMENTS: All software requires a CP/M operating system as well as indicated requirements listed below:

1. RECOMMENDED SYSTEM - CP/M 2.0 or higher, 48K memory, 200K dual disks 24-80 cursor addressable memory, 132 column printer.
2. 48K memory or higher.
3. 56K memory or higher.
4. 64K memory or higher.
5. CP/M 1.4 or higher.
6. Runs under CBM2.
7. CBASIC-2
8. BASIC-80 (MBASIC) 4.51
9. Signed license if required.
10. CP/M serial # required.
11. BASIC-80 (MBASIC) 5.0 or higher
12. Requires 280 CPU.
13. Associate system only.

CP/M is a registered trademark of Digital Research
280 is a registered trademark of Intel Inc.

LANGUAGES

BASICOM	\$ 800	\$ 395	2, 5, 9
C Compiler	650/30	450	4, 9
CBASIC-2	150/30	125	5
CB80	500/30	450	6
CBOL	750	625	2, 5, 9
FORTRAN-80, M-80, L-80	500	395	2, 5, 9
BASIC-80	350	285	2, 5, 9
PASCAL	500/35	312	
RATFOR	95	75	5, 12

LANGUAGE ASSEMBLERS/SUPPORT

MAC	90/15	85	5, 9, 10
M80	150	150	2, 5, 9
ZSD	100/15	90	12

WORD PROCESSING/OFFICE MANAGEMENT

DatStar	350/40	350	5, 9
MagicWand	395/40	370	2, 5, 9
MailMerge	125/25	105	5, 7, 9
SpellBrite	395/50	290	2, 5
SpellGuard	295/25	229	2, 5
SpellStar	250/25	250	5, 9
SuperSoft I	225/40	175	5, 9
The Word	75	65	1
WordStar	450/40	295	5, 9

OPERATING SYSTEM

CP/M	150/25	295	12
Target/IM	75	75	1

SYSTEM SUPPORT

BIOS Source	400	13
CRT from Listing	200	13
EDITCHAR	95	75
Monitor Source	495	395
Keyboard (PM)	89	75
SuperStar Op. System	125	100

*Does not include support other than provided with documentation.
Phone support available at list price.

ORDER INFORMATION

- Call (415) 638-1206
- Shipping/handling cost \$2.50 per item
- Call residents add 6 1/2% sales tax
- Terms: Cashers c/s/M.O., VISA/MC + 2.00, C.O.D. + 2.00
- All items subject to availability
- All prices subject to change without notice
- All orders shipped UPS, F.O.B. San Leandro
- Manual purchase will be applied to software purchases within 90 days
- The sale of each software conveys a license for use on one system only
- Dealer discounts available upon acceptance of signed dealer agreement

Remember good old-fashioned value?



You'll find it today...at California Computer Systems.

Whether you're upgrading your present system, or building a brand-new one, you'll find a generous serving of good old-fashioned value in the family of S-100 board-level products from California Computer Systems.

We offer you an assortment of boards to meet your every need: CPU, memory, I/O interface, disk controller, and more. We design extra value into every one we make.

How do we do it?

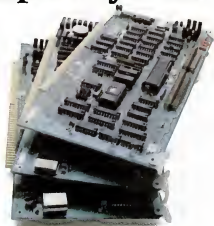
First, by putting bare boards, components, loaded boards — the whole store — through one of the toughest Q.A. programs in the industry. We test and burn-in our boards down to the last chip, so you can be sure our products are reliable.

We also give you great technical goodies. DMA, and the ECC in our hard disk controller, are just two examples of our commitment to engineering excellence. We offer you highly responsive service as well. Sweet prices, too.

It all adds up to great value... something you might expect from a company with extensive experience making reliable S-100 boards. And with many thousands proven in applications worldwide.

Why wait? Treat yourself to the good old-fashioned value you deserve — with the family of S-100 board-level products from CCS. For the whole scoop, call or write our marketing department today!

©1982, California Computer Systems, Inc.



California Computer Systems

250 Caribbean Dr., Sunnyvale, CA 94086
(408) 734-5811 Telex: 171959 CCS SUVL

Kaypro II—a low-priced, 26-pound portable micro

By Frank J. Derfler

The Kaypro II portable microcomputer is the product of a company that has experience in the electronic test-equipment industry. The Kaypro II reflects its heritage: It is a rugged, functional and practical computer system marketed at a reasonable price.

FEATURES: Electrically, the Kaypro II puts together the familiar combination of a Z80 CPU running under CP/M with 64K of RAM and two disk drives. Built into the package is a 9-inch monitor and a keyboard.

Physically, the complete Kaypro II is housed in a heavy-gauge metal cabinet

of the CP/M operating system. The operating system includes the standard utilities supplied by Digital Research plus special utilities to set the baud rate of the serial port and configure the I/O ports. It also comes with a simple dumb-terminal program.

On November 1, Nonlinear Systems will reportedly begin offering a different software package with the Kaypro II. (A company source told *InfoWorld* that the Select word processor will be dropped; the company will be supplying PerfectWriter, PerfectCalc, PerfectSpeller and PerfectMailer, along with SBASIC, CP/M and Profit Plan.)

PERFORMANCE: Since this is a por-

table computer, my evaluation included operation in many different settings. The Kaypro II spent many late summer days operating in the sun on the outside patio. I have used it in an office, in motel rooms and on the dining room table at home. It has traveled by plane, helicopter, truck and car in the U.S. and three other countries. The hardware never showed any quirks in these environments.

I was impressed with the quality of the display and the keyboard. The resolution of the screen is excellent and the keyboard is a pleasure to use. The price of the Kaypro II may be in the bargain class, but the hardware is first-

rate.

The power switch and reset switch are on the back of the cabinet. Since the unit is 15 inches deep, it isn't difficult to reach either switch from a seated position. I still hesitate, however, after years in the radio industry, to blindly put my hand in back of equipment. The reset worked no matter how badly I hung up the system. (Some keyboard resets don't work when you really need them.)

The disk drives worked efficiently and provided 192K of storage on each single-sided disk.

The Kaypro designers recognized

See Kaypro II, page 60

Kaypro II

Features of Unit Tested

- Z80 microprocessor
- 64K RAM
- Two double-density disk drives
- Monitor, 9-inch CRT
- Keyboard
- CP/M operating system
- SBASIC compiler
- Profit Plan spreadsheet
- Select word processor

Price: \$1795

Nonlinear Systems, Inc.

P.O. Box N
Del Mar, CA 92014

18 inches wide, 15 inches deep, and 8 inches high. The unit weighs 26 pounds. It has a carrying handle, and the keyboard closes over and protects the drives and CRT. The cabinet is painted blue.

The Kaypro II keyboard is complete. It provides the full ASCII character set, including control codes. It has a separate line-feed key, a lighted caps-only key, both a backspace and a delete key, a standard numeric keypad and four cursor arrows. The keyboard is detached from the unit and comfortable to use. The keys are in standard positions and large keytops are provided on the return and shift keys. The keys automatically repeat when you hold them down.

The monitor provides green-on-black letters with good contrast and clarity. It displays 24 lines of 80 characters. A person sitting at the full extension of the keyboard cable can easily read the screen. The top of the cabinet serves as a small sunshade for outside use, but a nonglare screen is not provided.

The disk drives are standard 5¼-inch, single-sided and double-density. Through some programming tricks, the Kaypro gets over 190K on each drive. The system reads disks prepared in the single-density Xerox 820 format.

The Kaypro II comes with an RS-232C serial port and a Centronics-compatible parallel printer port. Both ports appear on the rear of the cabinet in standard connectors.

The Kaypro II package includes the Select word processor from Select Systems, the Profit Plan spreadsheet from Chang Labs, an SBASIC compiler from Topaz programming, and version 2.2

NOW - A POWERFUL Z80 CP/M EDITOR FOR ONLY

\$25

That's right. WYLBUR® editors have been popular on IBM mainframes for over a decade. Micro-WYL implements all of the common WYLBUR commands with complete features for

collecting, inserting, deleting, replacing, and modifying text. Moving or copying text within a document. Copying text from external files. Global search and change operations. Listing control.

Marketing experts recommended a price of \$75-300

In fact Micro-WYL has been marketed at \$250/copy. So why are we selling it at \$25? We have cut our overhead to almost nothing - you are getting the product directly from its authors. We believe that there is an enormous market for high-quality, low-cost software. We intend to make a handsome profit by having thousands of satisfied customers.

We guarantee your satisfaction

If after reading the manual you feel that Micro-WYL is not for you, send it back with the sealed diskette unopened within 30 days. On the other hand, if you decide that it's as good as we believe, we authorize you to make copies of the manual and diskette for your friends at \$15 each. We'll put all of you on our mailing list for updates and enhancements.

If you feel that you must have proportional spacing, justification, etc. there are good word processors in the \$75-500 range. But for most users, Micro-WYL represents an incredible bargain. It is easy to learn, easy to use, and incredibly powerful. Send your check today - we'll ship within 4 days of receipt.

¹ CP/M is a registered trademark of Digital Research, Inc.

² WYLBUR is a registered trademark of The Board of Trustees of the Leland Stanford Junior University

Make your check out to:

Realworld Software, Inc. 913 S. Fourth St. Suite 103 DeKalb, IL 60115	Amount: \$25 plus \$2 for postage and handling.
---	---

CRT type _____	☐ 8" SSSD	☐ Osborne
	☐ KAYPRO II 5"	☐ Apple/Softcard
	☐ NorthStar 5" DD	☐ NEC 5"
	☐ Superbrain	☐ ALTOS Series 5

Name _____

Address _____

City _____ State _____ Zip _____

DATAFLEX™

The Multi-User Data Base

Imagine... a multi-user relational data base with automatic data protection! That's DataFlex, and it's available now.

DataFlex is the most flexible applications development data base available. It's relational, and it's truly multi-user. That means multiple users writing data to the same file or files at the same time. And, you can create complete software systems: menus, multi-key ISAM files,

screens, reports, and transaction processing. All with DataFlex... all without any other software.

Single user DataFlex runs under CP/M.* Multi-user versions are available for TurboDOS, TeleVideo's Mmmos!, Action Computer's DPC/OS™ Molecular Computer's n-Star™ OS, InfoSoft's Multi/OS™ and Multi/NET™, and the Xerox 820, Zenith and IBM PC (w/Baby Blue CPU) running on CORVUS Hard Disks. 8086 versions available soon.

Single user:	Multi-user:
\$750	\$995

DATAACCESS

CORPORATION
4221 Ponce De Leon Blvd.
Coral Gables, FL 33146
(305) 446-0669

*CP/M is a registered trademark of Digital Research.

Kaypro II

continued from preceding page
the need to tap into a source of available commercial software. Rather than trying to convince software distribution houses to provide software in their format, they gave the Kaypro II the ability to read the well-supported Xerox 820 format.

If you want to order software for the Kaypro II, you specify the Xerox format, copy the distribution disk to a Kaypro-formatted disk and run the software. The system works well and overcomes what could have been a major limitation in software portability.

I should comment on another kind of portability. The Kaypro's designers gave it a metal cabinet for ruggedness, but the metal adds to the weight. The system's 26 pounds is more than you'd probably care to carry from the parking lot at O'Hare Airport to gate D17. I strapped mine to a folding luggage cart and found it much easier to move. Some owners may wish to put casters on the bottom of the cabinet in place of the feet.

The Kaypro II fits under the passenger seats of wide-body jets. You may have trouble with it on smaller planes. If you have to take it as checked baggage, you will want to put it into its original shipping carton. The painted cabinet scratches and I would hate to see it bouncing down one of those luggage carousels.

The metal cabinet on the Kaypro II reduces the radiated electrical energy to a low level. The radiated interference on the weak, low-frequency television stations (channels 2 and 5) in my area was negligible.

The unit I tested did, however, have some conductive radiation through the power lines. My wireless intercom became noisy when the unit was turned on and really set up a racket when I used the disk drives. A filter in the line cord cured most of the problem. I checked with Nonlinear Systems, which confirmed that my evaluation unit did not have an internal line-filter installed. The company was aware that such a filter was needed and planned to install one on future production machines.

Overall, the Kaypro II is a useful device. Its standard software and interfaces, portability and excellent monitor and keyboard make it a top performer.

EASE OF USE: You can run an application program on a Kaypro II 30 seconds after you put it down on a desk. The simple integrated system allows you to plug in the computer, turn it on, remove the keyboard and insert a disk. No other connections (except for a printer or modem) need to be made. The CP/M operating system is completely standard and has no special tricks.

I did have a complaint about the RS-232C port. The Kaypro II, like many other machines, wants a high signal on pin 5 (clear to send) before it transmits. Normally, a jumper between pins 4 (request to send) and 5 takes care of this. This jumper feeds the computer its own high signal. For some reason not yet clear to me, I had to connect a jumper from pin 5 to pin 6 (data set ready) to get a high signal. This isn't a big problem. If my printer set pin 5

high (as most do) I wouldn't have noticed it, but it is unusual.

The Kaypro II has no expansion capability except through the parallel and serial ports. It is a well-integrated and capable microcomputer, but if you need a data bus for special interfaces, you should consider another system.

This is a hardware review, so I won't go into depth on the software in the Kaypro II package. The Select word processor and Profit Plan spreadsheet are both easy to use. I found no bugs in either one.

The Select word processor comes with a Teach tutorial package that provides a series of interactive lessons on its functions. The word processor is

[See Kaypro II, page 61](#)



The Kaypro II has a 9-inch CRT, two high-density disk drives, and a Z80 processor.



Quadboard, an expansion card for the IBM PC

By Frank J. Derfler, Jr.

IBM says its Personal Computer has five expansion slots. In this case, IBM may be misusing the word expansion, because cards that play a vital role in the operation of the basic system occupy several of these slots.

The disk controller and video card occupy two slots in most systems and the parallel-printer card takes a third. Additional RAM is often put on a fourth card, leaving only one slot for a serial port, game card, second CPU, hard-disk controller or any of the other available functional cards.

One of the first companies to see a large market for this limited space was

Quadram Corporation. It offers the Quadboard, which combines the functions of a clock, serial port, parallel printer port and RAM on a single card. It recently added RAM-disk software to the Quadboard package.

FEATURES: The Quadboard allows you to put the most commonly needed PC expansion features into one slot. It contains an RS-232C serial port that exactly duplicates the function of the \$150 IBM serial card. The parallel-printer port emulates the parallel port found on the monochrome display board. You can use either of these ports as a second port to one existing in the system.

Two dip switches control the port selection and status. These switches also control memory size, memory bank selection and clock status.

The clock on the Quadboard is both a clock and calendar. The Quadram distribution diskette contains BASIC and assembly-language programs that integrate the hardware clock with the system. You can make either of these programs part of an AUTOEXEC.BAT file so system time and date are set whenever you boot the DOS. The clock has an on-board rechargeable battery that can keep it alive for several months if the computer is not turned on.

The RAM portion of the Quadboard holds nine 64K chips in four rows. The PC uses the ninth chip for parity checking. The RAM chips are in sockets and you can order the board in 64K increments, up to 256K. You can easily add chips to boards that are originally delivered with less than 256K.

The Quadboard's RAM would only be a lot of memory if it weren't for the

See Quadboard, page 62

Kaypro II

continued from preceding page
menu-driven and provides full capabilities for editing, formatting and printing. It uses a number of overlay modules, so it isn't the world's fastest word processor, although it is powerful.

The spreadsheet is for business users and provides good prompts. I liked Profit Plan better than some of the better-known spreadsheets because of its ability to allow large labels and its simple command structure.

I did little with the SBASIC compiler. It seemed efficient, but not simple. The programmer has to declare all variables and the files appear to be character-oriented. The disk I/O functions seem unique and programs written for other, more commonly used, BASIC dialects would have to be converted into SBASIC.

The applications programs in the Kaypro II package complement the hardware because they are powerful, easy to use and reliable.

DOCUMENTATION: The documentation provided with the Kaypro II is only fair. It includes adequate manuals for the word processor and spreadsheet that come from the original distributors. The Teach software improves the score for the word processor considerably. The CP/M documentation consists of the standard set of books from Digital Research. If you are a novice to computers, these books don't help.

The hardware documentation I received was clearly marked as "preliminary," so I won't knock it too hard. It does need some information on the display characteristics of the Kaypro II to aid users in installing screen-oriented applications software, such as word processors. It also needs to include more information on the serial port.

SERVICEABILITY: Since the Kaypro II is an integrated device, servicing it means taking in the entire system. Service is provided by Kaypro dealers and by Nonlinear Systems. Physically, the unit is not difficult to work on, but there are no service adjustments that the user can make.

Nonlinear Systems has several years of experience in the manufacture of portable equipment. It introduced the first practical digital voltmeter and its portable oscilloscope has been a favorite of field technicians.

SUMMARY: Every system has some measure of value based on usefulness divided by price. The Kaypro II's value measurement is high. It provides many easy-to-use features and compares favorably with systems that sell for \$1000 more without software. ■

North Star can make you a Star.

Everything it takes to make your systems package a feature attraction.

As a leading supplier of hardware and software to small systems houses, North Star is always on the lookout for talented systems integrators who need quality microcomputer products and support. Whether you need hardware, software or a combination of the two, we can provide you with development products that meet your needs.

Your ticket to fame and fortune.

Our North Star ADVANTAGE integrated desktop business computer features 640 x 240 pixels monochrome graphics, a standard Z80A* with optional 8088 CPU co-processor, dual 5 1/4" floppy or floppy plus 5 1/4" hard disk storage and Local Area Network capability. And list-priced from \$3599, our North Star ADVANTAGE offers incredible price/performance. We also offer our low cost HORIZON* systems in both single-user and multi-user configurations. The HORIZON features an S-100 bus, a Z80A CPU and floppy as well as 5 1/4" and 14" hard disks.

All the tools you need to write your own smash hit.

We offer standard, user-proven business applications software programs as well as our "C"-based application development system. Add to that our

The North Star logo and HORIZON are trademarks or registered trademarks of North Star Computers, Inc.

variety of powerful business languages and industry standard as well as proprietary operating systems, and North Star gives you the software tools you need to produce a truly capable business system. Standard applications software includes analysis spreadsheets, word processing, accounting and data base management. Standard languages other than "C" include FORTRAN, COBOL, BASIC and Pascal. In addition to the industry standard CP/M* operating system, you can also select from North Star DOS and ASP for both single-user and multi-user system configurations, and MSDOS* for 16-bit applications.

With our great supporting cast, you'll get rave reviews.

We offer comprehensive technical support including hardware and software training, technical manuals, nationwide service and a special factory telephone number for technical inquiries. And we make it easier for you to do business by providing you with discount development units, sales leads, a third party software directory, company newsletters, sales promotion material, nationwide advertising and a nationwide network of distributors and North Star sales offices.

Call us for an audition today.

For more information call (415) 357-8500, ext. 504 or 534.

We want to help make you a star.

CP/M is a registered trademark of Digital Research Inc.

Z80A is a registered trademark of Zilog, Inc.

MSDOS is a trademark of Microsoft, Inc.

FOLLOW THE STAR

NorthStar™



14440 Catalina Street, San Leandro, California 94577

**HIGH-TECH
CREATIVE &
ZHIVAGO**
ADVERTISING
417 TASSO STREET • PALO ALTO, CA • 94301 • (415) 328-7830

Quadboard

continued from preceding page
addition of the QuadRAM-Drive program. QuadRAM-Drive provides what is generically known as RAM-disk operation. A portion of the system memory acts as a solid-state disk drive.

The system intercepts the operating-system calls to drive C or D (depending on how many drives are in the system) and sends them to the memory. The DOS acts as if it is reading and writing data to and from a fast mechanical drive. You must load program or data files into the RAM-disk each time you start or restart the system, but this can also be part of a AUTOEXEC.BAT file. A RAM-disk system such as QuadRAM-Drive can cut

the running time of certain kinds of disk-intensive programs by 80% or more.

The disadvantage of RAM-Drive systems is the need for discipline. Since the system is manipulating files in volatile RAM, you must save any new data to a mechanical disk drive before the system shuts down. If the system is shut off, crashes or suffers a power failure, you'll lose the files that were created only in the RAM-disk.

Fortunately, PC-DOS allows good cross-disk file creation and access, so it is possible to automatically write a created file to a mechanical disk while doing the normally time-consuming reads from the fast RAM-disk.

PERFORMANCE: The performance of the Quadboard is excellent in every

Quadboard

Features of Unit Tested

- RS-232 serial port
- Parallel printer port
- Clock/calendar
- Expansion RAM in 64K blocks

Price: \$595 (with 64K RAM)
\$775 (with 128K RAM)
\$895 (with 192K RAM)
\$995 (with 256K RAM)

Quadram Corporation

4357 Park Drive
Norcross, GA 30093

way. Physically, the large board is sturdy and exhibits no hot spots. The parallel and serial ports use exactly the same addresses (and many of the same parts) as their IBM counterparts and operate with all standard software.

I used the serial port in a local loop with another system at 9600 baud with no problems. In addition, I used the parallel printer port with both the IBM printer and a Smith-Corona TP-1, with no difference from the IBM card. The connectors are exactly the same as those used on the IBM boards, so you need no special adapters or arrangements.

One particularly useful feature is that you can designate the Quadboard ports as secondary ports to other ports in the system. Various software packages allow you to use two different printer or serial ports. The Quadboard serial port can operate as port 2 under PC DOS 1.1. Some older boards that carry two serial ports cannot function under DOS 1.1 because of a change in the interrupts.

The clock/calendar operates with good accuracy. A trimmer capacitor is available to adjust the timing of the clock if it drifts. The clock power-on programs set the system time to the

You, your child or your secretary

can now use your computer and never have to open a book!

One hour of easy listening replaces all the confusing written manuals usually required to begin using your new computer.



When the computer is unpacked and the power is turned on, you are anxious to do more than merely admire the attractiveness of your new computer. You made an investment for a purpose! Why not get the system up and running instantly?

If your application is business, you don't really have a lot of time to study the BIG THICK MANUALS! They are fine for researching more advanced applications. For now you want to realize the benefits of the word and number processing power available at your finger tips!

Buy the Computer you have your heart set upon and let us teach you how to manipulate the operating system. Buy the Word and Number Processing software to let it perform all your important business functions and let us PATIENTLY, INEXPENSIVELY and INSTANTLY get the system down to the business of producing RESULTS!

Available nationwide at "The Xerox Stores," participating Computerland Stores and other selected dealers.

MOST PRICED UNDER \$40

These "plain language" condensed user's manuals are available now in standard audio cassette. Many others are being developed and will soon be available...

Apple II+¹
Cromemco¹⁵
Franklin¹⁷
H/Z 89¹
Z/100¹

IBM PC³
Osborne 1⁴
Sony¹¹
Toshiba¹⁸
Xerox 820 II¹⁶

CP/M Gen¹⁴
CP/M 86¹⁴
CalcStar¹²
Condor¹²
dBase II¹²

DateStar¹²
DB Master¹²
Exec Sec¹²
EasyWriter¹²
Magic Wand¹²
PowerText¹²

SuperCalc¹⁰
SuperWriter¹⁰
VisiCalc¹¹
WordStar¹⁰
Adv. WordStar¹⁰

DEALERS:

Add a CUSTOMER SUPPORT department to your store. Use your time for SELLING not TEACHING! Your customers will have their new computer up and operating the day of purchase! END THE USER MANUAL MYSTERY, stock MICRO Instructional tapes!

TRADEMARKS OF: 1. Apple Corp.; 2. Heath Company; Zenith Radio Corp.; 3. IBM Corp.; 4. Osborne Computer Corp.; 5. Xerox Corp.; 6. Ashton Tate; 7. Peach Tree; 8. Berman Printer; 9. I/O; 10. Sanyo; 11. VisiCalc; 12. MicroPro Int. Corp.; 13. Sci/Soft; 14. Digital Research; 15. Cromemco; 16. Condor Computer; 17. Franklin Computer Corp.; 18. Sanyo; 19. Sony; 20. Toshiba Electronics

Copyright 1992 MICRO Instructional Inc.

MICRO INSTRUCTIONAL INC.

INSTRUCTIONAL INC.

6299 W. SUNRISE, FT. LAUDERDALE, FL 33313, (305) 584-3133

WE FIX

MICRO COMPUTERS...
DISK DRIVES... BOARDS...
S100 SPECIALISTS

The Computer Service Center

1514 University Ave.
Berkeley, CA 94703
415-845-6518

clock time.

The RAM set worked as it should. The chips on the two Quadboards that I saw were from Motorola. The QuadRAM-Drive software worked well with both PC-DOS 1.0 and 1.1.

EASE OF USE: You must consider both the ease of installation and of operation with a product like the Quadboard.

The installation is only a trifle more complex than the installation of most other IBM expansion cards. All installations require you to remove the PC's cabinet (two screws), remove one of the small back panels over the expansion port (one screw), insert the card and replace the screws. As with all memory cards, a Quadboard installation requires you to set the size of the system memory using one of the dip switches on the main system board. This only takes a moment, after you read the documentation.

Because there isn't room on the back panel of the Quadboard for the two DB-25 connectors you need for

the printer and serial ports, the printer connector is routed off the board with a socket, header plug and ribbon cable.

A DB-25 socket on the end of the ribbon cable is designed to be mounted in the knockout hole found in the back panel of most PCs. I say most PCs, because I understand several production runs came out without this knockout hole.

To find this hole, follow your keyboard cable to the back of the PC. Directly above the keyboard and cassette plugs there is probably a rectangular snap-on cover. If it is there, you can install the Quadboard easily and neatly. If it isn't there, you can still run the ribbon cable out between the cabinet and the back panel, but it won't look as pretty.

In the Quadboards I saw, it was possible to improperly insert the header plug from the printer cable into the socket on the board. There was no key to distinguish top from bottom. The

See Quadboard, page 64

Buy low, sell high.

Call Software Wholesalers today.

To survive and prosper in today's bullish software retail market, you will have to learn what every successful investor already knows — buy when the price is low, then maximize your opportunities to sell.

That's where Software Wholesalers can help. First, we make certain you always get the lowest possible wholesale price on the most heavily traded CP/M® and IBM PC programs. Blue-chip names like Ashton-Tate's™ MicroSoft® Micropro® Sorcim™ and Digital Research® in a wide range of 8" and 5¼" formats, including NorthStar® Televideo, Vector, and many, many others.

And our full dealer discount applies to every order you place — large or small — starting with the very first program.

Then to help you get the best return, we back our products up with a complete literature program, and with expert technical support from our staff of software professionals. You'll get sound advice as well as up-to-date information on updates and revisions, and insider's tips on hot new products.

And since we have already made substantial investments in stocks of these fine programs, the chances are excellent we have the software you need on hand. We process all orders the same day, and ship in-stock items the next. We'll even handle overnight express. And our liberal return policy allows you to return any unopened software within 30 days for a cash refund, or within 90 days for merchandise credits.

If you've made a long term investment in selling microcomputers, you should know about the wholesale resource that understands your need for capital gains.

Call Software Wholesalers before you place your next order. We're the one distributor that won't sell you short.

Software Wholesalers, Inc.

617-961-3171

York Plaza, Route 139, Randolph, MA 02368
Call for our complete catalog and a dealer kit.

ESTABLISHED COMPUTER RETAILERS & ISO'S ONLY**

* signifies manufacturer's trademark.

dBASE II® With Zip Screenbuilder \$495

CP/M® - IBM® SOFTWARE

FOX & GELLER®

Quickcode\$229
dUTIL 69

SORCIM®

Supercalc 209

PERFECT SOFTWARE®

Perfect Writer 269

Perfect Speller 149

MICROSOFT®

Basic 80 284

Basic 80 Compiler 325

8" and 5¼" Formats

MICROPRO®

Wordstar\$279

Mailmerge 89

Spellstar 149

Dalstar 219

Calstar 169

Supersort 169

Wordstar/Spellstar/

Mailmerge Package 469

Calstar/Dalstar/

Supersort Package 469

CALL FOR PRICES ON OTHER SOFTWARE PACKAGES

**AMERICAN
DIGITAL**

*Registered trademarks.
All items subject to availability and price change.

(703) 620-2078

VISA/MasterCharge, COD
AMERICAN DIGITAL CORPORATION
12310 Pinecrest Road, Reston, VA 22091

if you use CP/M® then you need DISK FIX!

DISK FIX is a disk editor which can display, edit or copy any sector of a CP/M 2.xx floppy and/or hard disk. The DISK FIX utility can be used to recover files from disks with damaged directories, to reconstruct files with bad sectors, to restore erased files and to do general disk editing.

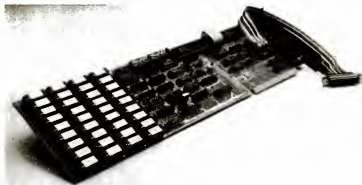
Direct on screen editing is provided in both HEX and controlled ASCII. DISK FIX automatically configures to floppy and hard disks, just insert the program disk and it is ready to run. A single CPU license is available for \$150. For further information, call our software HOT LINE.

The Software Store

706 Chipewas Square • Marquette MI 49855 • Phone: 906/228-7622

Shipping \$3 USA/88 Foreign
Prepaid, COD, VISA or
MASTERCARD orders accepted
Complete catalog available

CP/M is a trademark of
Digital Research Inc.
DISK FIX is a trademark of
The Software Store



The four rows of chips on the Quadboard each hold 64K of RAM. With the dip switches on the top of the board, you set memory status and port addresses. The ribbon cable extends the printer port out to a knockout hole in the back panel of the IBM PC.

Quadboard

continued from preceding page
direction in which the cable came out of the plug gave you a good clue, but it was still easy to insert incorrectly. When I asked about this, Charlie Henderson of Quadram said that the company is now putting a dot of color on the socket and the board to show the proper orientation.

The installation of the Quadboard takes only a few minutes and requires no special knowledge aside from the directions in the manual.

The use of the Quadboard software is also quite simple. You use two programs, SETCLK and PWRUPCLK, to set the hardware clock and to integrate the hardware clock with the system

time. The QuadRAM-Drive software is a small program with only one variable—the number of 32K blocks you use for the QuadRAM-Drive. All you do to use the QuadRAM-Drive is to type QD followed by the number of 32K blocks of memory you wish to use.

This software selection of the RAM-disk size gives you good flexibility, so you can operate your system with many different kinds of programs. If you are using a program with many arrays, you can allocate more RAM to the transient program area. If you need to access large data files, you can allocate the maximum amount of memory to RAM-disk. You always have to give the PC 64K to operate in, so the minimum RAM you need in a system using

See Quadboard, page 66



Learn what you need to know about personal computers and the things that go with them. UNDERSTANDING PERSONAL COMPUTERS is a series of video tape programs, each covering a single topic in detail. Concepts are simply explained and illustrated—working products are demonstrated. Programs are complete within themselves or may be used as modular parts for:

- SELF INSTRUCTION
- SUPPORT FOR SEMINARS
- A SUPPLEMENT TO EDUCATIONAL PROGRAMS
- SALES SUPPORT FOR COMPUTER RETAILERS

As an example, the program THE PRINTER is a fast-paced 22-minute video presentation covering all the common types of printers showing both how they function, what they are designed to do and how they are best applied.

Besides THE PRINTER now available series programs include INTRODUCTION TO PERSONAL COMPUTING, THE APPLE II, THE DISK DRIVE, INTRODUCTION TO WORD PROCESSING—and many more coming.

Only \$49.95 a program. To order call (800) 824-7888; from Alaska or Hawaii, call (800) 824-7919; in California, call (800) 852-7777. For all numbers, ask for Operator 921. Or send your check to Decision Information Services, P.O. Box 5849, Stamford, CA 94305. Add \$2.00 shipping and handling. Specify VHS or Beta. MasterCard or VISA accepted.

UNDERSTANDING PERSONAL COMPUTERS

This high quality series of programs is produced by Dr. Colin Mick and John Woodworth, both well known authorities and teachers of computer techniques.

The source for the latest in video equipment—



Adolph Gasser Inc has become a leader in the video industry by delivering service with the sale and by being aware of new technological developments. Let our professional sales staff give you a "hands-on" demonstration of these products and more.

NEW! Panasonic
above: NV-8500 Editing System. The first professional 1/2" VHS system.



WV-777 Video Camera
Three tube, ENG/EPF prism optics design.



Adolph Gasser
(415) 495-3852 181 Second St./San Francisco

COMPUTER SPECIALISTS Purchase Access/80 for 3 Reasons...

CONVENIENCE

Simple, English-like command statements make it 30 times easier to generate reports and cross-tabulations with Access/80 using your existing BASIC, FORTRAN or COBOL data files.

PROFIT

Faster dialogue with Access/80 means you can produce more reports and more extensive statistical cross-tabulations in less time.

PRESTIGE

Access/80 reports look better with less effort than reports generated under BASIC, COBOL or FORTRAN programs. You'll be proud to turn them over to customers.

ACCESS/80 can turn your microcomputer into as powerful a report generator and cross-tabulator as those used on IBM 370 mainframes, like EASYTRIEVE, CULPRIT and NOMAD. It will run on virtually any 8080, Z80, 8085 or 8086 microcomputer using CP/M*, MP/M* or CP/M-86*.

ACCESS/80 Report Generator and Cross-Tabulator

*Trademark of Digital Research, Inc.

For complete information,
see your local
Friends Software Dealer,
or contact:



FRIENDS SOFTWARE
PO BOX 527
Berkeley, CA 94701
(415) 540-7282

New peripherals



The Esprit III, a high-performance video-display terminal from Hazeltine

Hazeltine has added a new video-display terminal to its Esprit line. The Esprit III is a high-performance CRT with detachable keyboard that emulates the Televideo 950, but costs less, according to Hazeltine. The terminal costs \$895 in single-unit quantities. Hazeltine Corporation, Greenlawn, NY 11740.

Orchid Technology is marketing a local-area network for the IBM Personal Computer called PCnet. According to the company, the network system offers very high speed and allows long distances between stations up to 7000 feet. The PCnet system lets several Personal Computers share one or more hard-disk drives, thus eliminating the necessity to shuffle floppy



Orchid Technology, which offers graphics capabilities, is marketing a local-area network for the IBM PC called PCnet.

disks.

The main component of the PCnet See *New peripherals*, page 66

ESSEX DATA SYSTEMS™

Cordially invites you to view the new
DYNABYTE 'MONARCH' 8/16 Bit Business Computer
at our New York City Showroom
505 Fifth Avenue, 9-5 Monday thru Friday
By Appointment Only, Please — (212) 490-2410

We • SELL
• BUY
• SERVICE
• SUPPORT

DYNABYTE
Business Computers

We also support • BUSINESS MANAGER • IMS SOFTWARE
• CP/M • MP/M

ESSEX DATA SYSTEMS

505 Fifth Avenue, New York, NY 10017

We are a full service computer company
specializing in Micro-Computer systems

* registered trademark of Digital Research Inc.

DEALERS INQUIRIES WELCOME

CRACK-SHOT

THE ULTIMATE IN COPY DE-PROTECTION
Not just another bit copier.

Blows Locksmith and Nibbles Away — AWAY
Even cracks all bit copiers in fifteen seconds

CRACK-SHOT is a hardware device that fits right in an Apple Slot and dumps all memory to disk.

- ★ Use as a gaming tool to stop, start, and save a game at any level.
- ★ Full monitor capabilities to examine, modify, trace single-step, or disassemble an interrupted program
- ★ Copies from DOS 3.2 to DOS 3.3
- ★ Faster and easier to use than any bit copier
- ★ Lets you suspend work with one program while you use another
- ★ Cracks single disk access programs in fifteen seconds, longer for multi-access

System Requirements: 48K Apple II or Apple II Plus

1 Disk Drive

Forward helpful but not required

Complete with Software and Instructions..... \$149.95

Cash, Check, Money Order, Mastercard or Visa accepted

Order now from:



PIRATES HARBOR

P.O. Box 8988, Boston, MA 02114 617/735-5051 MODEM

* is a registered trademark of Apple Computer. Pirates Harbor is the trademark of the Real Real



Waybern Leadership

keeps you ahead with
Televideo terminals.

Waybern Corporation™

The distributor of high value computer products.

12191 Mariners Way, Garden Grove, CA 92643 800-854-8348 from CA (714) 554-4520
Waybern Delivers The Best:

Manneemann Tally	Altos	Micro Pro	Diablo	Tru Bee	Chang Labs
Change Micro, Inc.	NEC	Racet	Corvus	ADDS	Ashton-Tate
Universal Data Systems	Eagle	Masell	Televideo	Dynabyte	Comore Data Systems

...and many more

FREE 1 STOP SHOP FOR MICROCOMPUTER GAMES

A Free Catalog — hundreds of the best games available anywhere. We selected the most challenging and most exciting — arcade, strategy and simulation games — everything from adventure, fantasy, war games, sports to classic board games.

Now one-stop shopping is easy with a single game source for the most popular home computers: Apple, TRS-80, Atari, Commodore Pet & Vic, Texas instruments and IBM. Full descriptions include hardware information.

Get your free games catalog today — simply send coupon below or call 1-800-431-2196. N.Y.S. Residents — 914-789-2802



EAV Software Inc.
17 Marble Avenue, Pleasantville, N.Y. 10570

Yes, rush my FREE catalog of Micro games and accessories today!

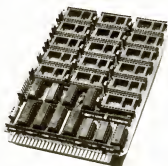
Name _____
Address _____
City _____
State _____ Zip _____

New peripherals

continued from preceding page
system is the PCnet adapter board, which occupies a slot in each PC in the network. Standard 75-ohm video cable connects the units.

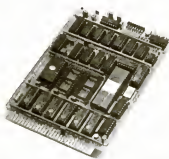
The price of the adapter, including software, is \$495 each. Orchid Technology, 1084 Hillview Drive, Milpitas, CA 95035.

Blue Chip Computers has announced two new CMOS boards, a memory board and a CPU board, that are manufactured by Baradine Products. Both devices offer the advantages of CMOS technology: low power consumption and the ability to operate over wide temperature ranges.



The STD-CMOS 32K memory board is fully TTL-compatible and STD-bus-compatible.

The STD-CMOS32K memory board



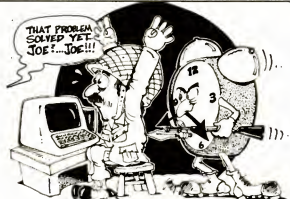
The STD-NSC800 CPU card includes an on-board I/O port and integrates CMOS technology.

is a 32K board that is fully STD-bus-compatible and TTL-compatible. You

can get the board with or without memory chips. Without memory it costs \$300; with full memory it costs \$825.

The STD-NSC800 central-processor card combines the potential of National Semiconductor's NSC800 chip and the advantages of CMOS technology. It includes an on-board I/O port. The price varies with the processor speed: one-megahertz cards cost \$675 each; 2.5-megahertz cards are \$750 each in single units. Blue Chip Computers, Inc., 7648 Heather Street, Vancouver, BC V6P 3R1, Canada.

InfoWorld is unable to test every product announced in this section. All claims attributed to the products have been made by manufacturers or by firms marketing these items.



LOSING TRACK OF CHANGES? "NOW! COMPARE files on CPM-80!"

- Compare Program Versions
- Fast, NO File Restrictions
- Side by Side or Vertical Listings of Differences
- Output to File or Printer
- Compare Documents
- Extensive User Options: Ignore Comments, Blank lines and more
- Create Documents with Change Bars
- Sensible Command Line defaults

COMPARE is a superb software tool with excellent features for the serious professional programmer with no time to waste. Document mode with Change Bars designed especially with Writers in mind.

Call or Write for Information Only \$95

SOLUTION TECHNOLOGY, INC.

Suite 218 • 1499 Palmetto Park Rd. • Boca Raton, FL 33432 • (305) 368-6228

*CPM-80 is a trademark of Digital Research Inc. *Check or COD. Florida residents add 5% sales tax

Computer Products International presents the

PAY-WARE PAYROLL SYSTEM

Pay-Ware was designed by CPI to meet the needs of the business person who will actually process the payroll. We offer programs created for Apple (Apple Soft) and Commodore 8000 or 9000 series with an 8050 disk drive plus a 3rd package designed for any CPM computer. CPI has been in business for 20 years and has pioneered and developed payroll packages that are in use in over 30 States. Pay-Ware offers a complete payroll package including year-end processing. The initial package (which can be up-graded) is priced at only \$395.00 (\$200 down, balance in 30 days).

Computer Products International
3225 Danny Park, Metairie, LA 70002

Name _____
Address _____
City _____
State _____ Zip _____
☐ Apple ☐ Comm. ☐ CPM
☐ Check enclosed ☐ COD (Co only)
☐ Visa ☐ Master Charge
Acct. No. _____
Exp. Date _____
Signature _____

COMPUTER PRODUCTS INTERNATIONAL

3225 Danny Park, New Orleans, LA 70002
(504) 455-5330



Quadboard

continued from page 64
QuadRAM-Drive is 96K.

DOCUMENTATION: Most of the documentation that I got is stamped "preliminary" or "under revision," but it still looks good. The manual covers installation and operation and is written in an easily understood manner. The operating manual is sized and punched to fit into the IBM documentation binders. If Quadram retains this manual, but expands the index, the documentation will provide a good guide to the use of the Quadboard.

SERVICEABILITY: If any of the major functions of the Quadboard fail, you have to send the board back to Quadram. It provides a one-year warranty on parts and labor. The memory chips are socketed, so you could do some troubleshooting by swapping chips, but you probably would not get warranty coverage. The other ICs are soldered in.

SUMMARY: The Quadboard lets you add the most commonly needed expansion features to the IBM PC, while saving both space and money. The QuadRAM-Disk feature can greatly increase program execution speed in even a relatively simple system. ■

BASIC/Z...

the ultimate CP/M compiler!

- Generates native code (8080/Z-80) for fast execution - 16 bit versions soon
- Sort verb is unmatched by stand-alones. 2000 elements in two seconds!
- Alpha-numeric labels
- Chain with common
- BCD floating point math - never a "round-off" error - precision is program definable from 6-18 digits
- Program editor tests syntax as you type
- Recursive, multi-line, user functions
- No royalties - No run-time charges
- Dimension arrays dynamically (to an expression) and selectively erase
- Screen oriented editing at run-time
- Trace and single-step debugging
- Multi-tiered error trapping even handles BIOS errors
- Cursor addressing, reverse and blinking video, erase and more are supported from source code level

For free brochure
and mini-manual:

System/z, Inc. * a trademark of Digital Research
P.O. Box 11
Richton Park, IL 60471 (312) 481-8085

System/z, Inc.

ARTICLE REPRINTS

InfoWorld is copyrighted. You must obtain written permission from us to reprint or copy our articles. We will handle your reprint requests in one of three ways:

- 1) **We'll do the printing:** Tell us which article(s) you want, and we'll do the rest. We will send you professionally printed reprints on white, 8 1/2 x 11, 60-pound, book paper. Charges will be determined by the length of the article(s) and the quantity ordered. Allow approximately 2 weeks for delivery.
- 2) **We'll do the pasteping:** We will supply you with 8 1/2 x 11, camera-ready photostats. Charges determined by length of article. Your printing company or your copier can use the photostat to make as many reprints as you like.
- 3) **Do-it-yourself:** Upon written request, we will give you written permission to reprint, and you do all the work. We only require that you use our standard credit line and send two copies of your printed version to the InfoWorld offices for verification and filing.

Every reprint request must include the issue date, page numbers, title and author. Contact: Terri Williams, INFOWORLD Reprints, 530 Lytton Avenue, Palo Alto, CA 94301, (415) 328-4802, or call toll-free (800) 237-4365 from outside California.

Positions Available

Positions Available

Recruit from major computer centers nationwide. List in Positions Available!

Sr. Academic Programmer/Consultant

Opportunity for individual with excellent technical and interpersonal skills who would enjoy a variety of responsibilities relating to customer service in an exciting technical environment. Act as liaison to academic departments. Efforts will be of a broad technical nature but with emphasis on project management and consulting in the area of personal computing; oversee operation of instructional microcomputer facility, help plan and implement campus-wide network for microcomputers, advise faculty on curriculum and software development.

Qualifications: Bachelor's degree or equiv. educ. & exp. 2+ yrs personal computing applications exp. using a variety of software & hardware. 5+ yrs. gen. computing exp., preferably applications in an academic or research environment. Exp. in customer svc. activities, project management, evaluating user needs, developing applications software, writing tech user doc., teaching.

Salary range: \$28-40K, based on experience.

Interested applicants are encouraged to submit a detailed application/resume to: Stanford University, Personnel-Ref. 26671, Attn: Art Wilson, IN, Stanford, CA 94305. (415) 497-3117. An equal opportunity employer through affirmative action.

Stanford University

41-PA-02

Consultants

TECHNICAL WRITING

- Installation, operation, service manuals
- Software user manuals
- Proposals
- Technical artwork

—Experienced, reliable, professional

Palmer Technical Services
881 Palmer (713) 285-1489
Houston, TX

Management Recruiters/ Silicon Valley

Specialized office, nation's largest firm. Hardware, software, CAD, robotics, development, MIS, etc. Engineers, Programmers, Managers.
1040 Marsh Rd., Ste. B240-E Menlo Park, CA 94025 (415) 328-8024.

41-PA-05

Software

IBM PERSONAL COMPUTER USERS!

Introducing COPY/PC

- A NEW copy utility that:
- allows you to make backup copies of many protected programs including "Visicalc" and EasyWriter!
- recovers usable data from partially damaged discs!
- is fast and easy to use!

\$34.95 (CASH) users only

Send check or money order to:

NAGSYSTEMS
4411 Geary Blvd.
Suite 201
San Francisco, CA 94118

*Visicalc and EasyWriter are trademarks of Personal Software and © 1985, respectively.

Positions Available

HIGH-PAYING COMPUTER JOBS NO COLLEGE DEGREE

New book tells how to get a job in the fast-growing data processing industry and how to get the high-paying jobs. Send for free details or send \$5.95 for book. 15 day money back guarantee.

Write Box 357752
Redondo Beach, CA 90277.

IBM SERIES I

EOL Programming qualities you to work on national telecommunications project. To 36K.

June Taylor

Executive Search

547 Texas St.

San Francisco, CA 94107

(415) 821-2474

32-PA-1

Positions Available

C & UNIX

Work experience with above qualifies you to learn graphics.

June Taylor

Executive Search

547 Texas St.

San Francisco, CA 94107

(415) 821-2474

20-PA-3

Business Opportunities

PROGRAM DEVELOPERS

Employ yourself... Write The Great Amer. Software in your own AZ hide-away! Lease house, furnished, sun-dek, trails, acres of desert privacy, miles of mt. vistas... Nov-May season: \$2900.

802/852-4444

Read InfoWorld

Classifieds

SOFTWARE PROGRAMS WANTED

Reader's Digest Services is looking for quality microcomputer software to publish and market. If you have a well-written productivity program, self-help program, or educational game program, we'd like to hear about it. We are interested in software for the Apple II, TRS-80 Model III, IBM PC, Sinclair ZX81, Osborne I, and Atari 400/800. Send a brief written description, including hardware specifications to:

Reader's Digest Services, Inc.
Dept. 05090
Pleasantville, NJ 08570

Positions Available

A-Z Opportunities with the Leader in Microcomputer Software

We're Digital Research, the creators of CP/M. Today we're working on software products for tomorrow that will set new standards for microcomputer performance and usability. Accept the challenge of the future by contributing your talents to the computer revolution.

We've got big plans for the future. We're expanding our product line to offer operating systems, graphics, languages, and utilities for a variety of microprocessors and microcomputers. And we're looking for exceptional people to help us develop them. Why not explore the following opportunities:

Quality Assurance Engineer

Test new products and review product manuals, and test operating systems, language compilers and graphic tools. Ability to program in assembly and high-level languages. BSCS, QA experience preferred.

R&D Programmer

Design and write original code in fields ranging from file systems, internal, intelligent user interfaces, BSCS. Three years' experience preferred.

Technical Writer

Responsible for document development and will need the ability to make obscure technical points brief and unambiguous. BSCS or related technical field preferred. Minimum 4 years' as Technical Writer documenting computer software.

Graphics Programmer

Graphics Software Engineer

Responsible for designing and developing systems level graphics software. BSCS or related technical education and experience.

Apply Today

Competitive salaries and benefits. Send your resume including salary history, to: Pauline Collett, Personnel Department, P.O. Box 579, Pacific Grove, CA 93950. Individuals only apply. We are an equal opportunity employer.

DIGITAL RESEARCH

Software

DISCOUNT SOFTWARE PRODUCTS

Over 300 Titles! Requested

CP/M, IBM, APPLE, THE DOS, DARTS, IV, COMANDOR

Discount Software Products carries 2700 different products in stock, including 22 formats.

We specialize in business software & carry 25 different formats (types of computer software will not only).

Free 72 page software catalog. Free 18 page hardware catalog. Add now and save time & money.

In Canada call: (416) 368-4825, International Software Associates, P.O. Box 263, Toronto, Ontario, Canada. Ontario.

Write: (214) 881-8888 PRIME CATALOG Orders: (800) 547-4996. Certified Reseller Code: 8720 King George Dr., Ste. 118, Dallas, TX 75238

Registered Trademarks

Software

CONDOR DATABASE

THE LEADING RELATIONAL DATABASE MANAGEMENT SYSTEM

- Easiest to Learn
- Easiest to Use
- Complete
- Best Support
- Highest Sales
- Operator Aids

"Condor brings the computer to the ordinary person"

CONDOR (CP/M) IS AVAILABLE ON:

Teleview Hewlett Packard

Xerox NEC

BMC Many Others

standard software

CORPORATION OF AMERICA

10000 North Central Expressway, Suite 1000

817-563-7220

1-800-343-8420



Turn your hardware into hard cash! Place your ad today in InfoWorld's Classified section!

Classified Ads

Software

SOFTWARE GALEORE DISCOUNT DISCOUNT

You have never bought a software package until you have bought it from Software Galore. We tried for a year but it wasn't meant to be. It's our second year of opening and we're still going strong.

APPLY 10% OFF

ITEM	UNIT	PRICE
Mac 3500 (Letter Quality)	2,290.00	1,332.00
Macintosh IIx	915.00	513.00
Raychem Omega 286	129.00	72.90
Raychem Omega 386	249.00	136.90
Raychem Omega 486	449.00	246.90
Raychem Omega 586	649.00	359.90
Raychem Omega 686	849.00	472.90
Raychem Omega 786	1,049.00	585.90
Raychem Omega 886	1,249.00	698.90

WORD PROCESSING

• The Word Harder	199.95	145.95
• Microsoft Word 6.0	129.00	105.00
• Microsoft Word 7.0	139.00	105.00
• Microsoft Word 8.0	149.00	105.00
• Microsoft Word 9.0	159.00	105.00
• Microsoft Word 10.0	169.00	105.00
• Microsoft Word 11.0	179.00	105.00
• Microsoft Word 12.0	189.00	105.00
• Microsoft Word 13.0	199.00	105.00
• Microsoft Word 14.0	209.00	105.00
• Microsoft Word 15.0	219.00	105.00
• Microsoft Word 16.0	229.00	105.00
• Microsoft Word 17.0	239.00	105.00
• Microsoft Word 18.0	249.00	105.00
• Microsoft Word 19.0	259.00	105.00
• Microsoft Word 20.0	269.00	105.00
• Microsoft Word 21.0	279.00	105.00
• Microsoft Word 22.0	289.00	105.00
• Microsoft Word 23.0	299.00	105.00
• Microsoft Word 24.0	309.00	105.00
• Microsoft Word 25.0	319.00	105.00
• Microsoft Word 26.0	329.00	105.00
• Microsoft Word 27.0	339.00	105.00
• Microsoft Word 28.0	349.00	105.00
• Microsoft Word 29.0	359.00	105.00
• Microsoft Word 30.0	369.00	105.00
• Microsoft Word 31.0	379.00	105.00
• Microsoft Word 32.0	389.00	105.00
• Microsoft Word 33.0	399.00	105.00
• Microsoft Word 34.0	409.00	105.00
• Microsoft Word 35.0	419.00	105.00
• Microsoft Word 36.0	429.00	105.00
• Microsoft Word 37.0	439.00	105.00
• Microsoft Word 38.0	449.00	105.00
• Microsoft Word 39.0	459.00	105.00
• Microsoft Word 40.0	469.00	105.00
• Microsoft Word 41.0	479.00	105.00
• Microsoft Word 42.0	489.00	105.00
• Microsoft Word 43.0	499.00	105.00
• Microsoft Word 44.0	509.00	105.00
• Microsoft Word 45.0	519.00	105.00
• Microsoft Word 46.0	529.00	105.00
• Microsoft Word 47.0	539.00	105.00
• Microsoft Word 48.0	549.00	105.00
• Microsoft Word 49.0	559.00	105.00
• Microsoft Word 50.0	569.00	105.00
• Microsoft Word 51.0	579.00	105.00
• Microsoft Word 52.0	589.00	105.00
• Microsoft Word 53.0	599.00	105.00
• Microsoft Word 54.0	609.00	105.00
• Microsoft Word 55.0	619.00	105.00
• Microsoft Word 56.0	629.00	105.00
• Microsoft Word 57.0	639.00	105.00
• Microsoft Word 58.0	649.00	105.00
• Microsoft Word 59.0	659.00	105.00
• Microsoft Word 60.0	669.00	105.00
• Microsoft Word 61.0	679.00	105.00
• Microsoft Word 62.0	689.00	105.00
• Microsoft Word 63.0	699.00	105.00
• Microsoft Word 64.0	709.00	105.00
• Microsoft Word 65.0	719.00	105.00
• Microsoft Word 66.0	729.00	105.00
• Microsoft Word 67.0	739.00	105.00
• Microsoft Word 68.0	749.00	105.00
• Microsoft Word 69.0	759.00	105.00
• Microsoft Word 70.0	769.00	105.00
• Microsoft Word 71.0	779.00	105.00
• Microsoft Word 72.0	789.00	105.00
• Microsoft Word 73.0	799.00	105.00
• Microsoft Word 74.0	809.00	105.00
• Microsoft Word 75.0	819.00	105.00
• Microsoft Word 76.0	829.00	105.00
• Microsoft Word 77.0	839.00	105.00
• Microsoft Word 78.0	849.00	105.00
• Microsoft Word 79.0	859.00	105.00
• Microsoft Word 80.0	869.00	105.00
• Microsoft Word 81.0	879.00	105.00
• Microsoft Word 82.0	889.00	105.00
• Microsoft Word 83.0	899.00	105.00
• Microsoft Word 84.0	909.00	105.00
• Microsoft Word 85.0	919.00	105.00
• Microsoft Word 86.0	929.00	105.00
• Microsoft Word 87.0	939.00	105.00
• Microsoft Word 88.0	949.00	105.00
• Microsoft Word 89.0	959.00	105.00
• Microsoft Word 90.0	969.00	105.00
• Microsoft Word 91.0	979.00	105.00
• Microsoft Word 92.0	989.00	105.00
• Microsoft Word 93.0	999.00	105.00
• Microsoft Word 94.0	1,009.00	105.00
• Microsoft Word 95.0	1,019.00	105.00
• Microsoft Word 96.0	1,029.00	105.00
• Microsoft Word 97.0	1,039.00	105.00
• Microsoft Word 98.0	1,049.00	105.00
• Microsoft Word 99.0	1,059.00	105.00
• Microsoft Word 100.0	1,069.00	105.00

DATA BASE

• D. B. Master	229.00	145.00
• Data Base II	250.00	150.00
• Data Base III	300.00	175.00
• Data Base IV	350.00	200.00
• Data Base V	400.00	225.00
• Data Base VI	450.00	250.00
• Data Base VII	500.00	275.00
• Data Base VIII	550.00	300.00
• Data Base IX	600.00	325.00
• Data Base X	650.00	350.00
• Data Base XI	700.00	375.00
• Data Base XII	750.00	400.00
• Data Base XIII	800.00	425.00
• Data Base XIV	850.00	450.00
• Data Base XV	900.00	475.00
• Data Base XVI	950.00	500.00
• Data Base XVII	1,000.00	525.00
• Data Base XVIII	1,050.00	550.00
• Data Base XIX	1,100.00	575.00
• Data Base XX	1,150.00	600.00
• Data Base XXI	1,200.00	625.00
• Data Base XXII	1,250.00	650.00
• Data Base XXIII	1,300.00	675.00
• Data Base XXIV	1,350.00	700.00
• Data Base XXV	1,400.00	725.00
• Data Base XXVI	1,450.00	750.00
• Data Base XXVII	1,500.00	775.00
• Data Base XXVIII	1,550.00	800.00
• Data Base XXIX	1,600.00	825.00
• Data Base XXX	1,650.00	850.00

SUPPLIES

• Floppy Emulator	29.95	25.95
-------------------	-------	-------

FIRMWARE

• Microsoft 10K Ram	195.00	115.00
• Microsoft 20K Ram	239.00	135.00
• Microsoft 40K Ram	479.00	275.00
• Microsoft 80K Ram	959.00	550.00
• Microsoft 160K Ram	1,919.00	1,100.00
• Microsoft 320K Ram	3,839.00	2,200.00
• Microsoft 640K Ram	7,679.00	4,400.00
• Microsoft 1.2MB Ram	15,359.00	8,800.00
• Microsoft 2.0MB Ram	30,719.00	17,600.00
• Microsoft 4.0MB Ram	61,439.00	35,200.00
• Microsoft 8.0MB Ram	122,879.00	70,400.00
• Microsoft 16.0MB Ram	245,759.00	140,800.00
• Microsoft 32.0MB Ram	491,519.00	281,600.00
• Microsoft 64.0MB Ram	983,039.00	563,200.00
• Microsoft 128.0MB Ram	1,966,079.00	1,126,400.00
• Microsoft 256.0MB Ram	3,932,159.00	2,252,800.00
• Microsoft 512.0MB Ram	7,864,319.00	4,505,600.00
• Microsoft 1.024MB Ram	15,728,639.00	9,011,200.00
• Microsoft 2.048MB Ram	31,457,279.00	18,022,400.00
• Microsoft 4.096MB Ram	62,914,559.00	36,044,800.00
• Microsoft 8.192MB Ram	125,829,119.00	72,089,600.00
• Microsoft 16.384MB Ram	251,658,239.00	144,179,200.00
• Microsoft 32.768MB Ram	503,316,479.00	288,358,400.00
• Microsoft 65.536MB Ram	1,006,632,959.00	576,716,800.00
• Microsoft 131.072MB Ram	2,013,265,919.00	1,153,433,600.00
• Microsoft 262.144MB Ram	4,026,531,839.00	2,306,867,200.00
• Microsoft 524.288MB Ram	8,053,063,679.00	4,613,734,400.00
• Microsoft 1,048,576MB Ram	16,106,127,359.00	9,227,468,800.00
• Microsoft 2,097,152MB Ram	32,212,254,719.00	18,454,937,600.00
• Microsoft 4,194,304MB Ram	64,424,509,439.00	36,909,875,200.00
• Microsoft 8,388,608MB Ram	128,849,018,879.00	73,819,750,400.00
• Microsoft 16,777,216MB Ram	257,698,037,759.00	147,639,500,800.00
• Microsoft 33,554,432MB Ram	515,396,075,519.00	295,279,001,600.00
• Microsoft 67,108,864MB Ram	1,030,792,151,039.00	590,558,003,200.00
• Microsoft 134,217,728MB Ram	2,061,584,302,079.00	1,181,116,006,400.00
• Microsoft 268,435,456MB Ram	4,123,168,604,159.00	2,362,232,012,800.00
• Microsoft 536,870,912MB Ram	8,246,337,208,319.00	4,724,464,025,600.00
• Microsoft 1,073,741,824MB Ram	16,492,674,416,639.00	9,448,928,051,200.00
• Microsoft 2,147,483,648MB Ram	32,985,348,833,279.00	18,897,856,102,400.00
• Microsoft 4,294,967,296MB Ram	65,970,697,666,559.00	37,795,712,204,800.00
• Microsoft 8,589,934,592MB Ram	131,941,395,333,119.00	75,591,424,409,600.00
• Microsoft 17,179,869,184MB Ram	263,882,790,666,239.00	151,182,848,819,200.00
• Microsoft 34,359,738,368MB Ram	527,765,581,332,479.00	302,365,697,638,400.00
• Microsoft 68,719,476,736MB Ram	1,055,531,162,664,959.00	604,731,395,276,800.00
• Microsoft 137,438,953,472MB Ram	2,111,062,325,329,919.00	1,209,462,790,553,600.00
• Microsoft 274,877,906,944MB Ram	4,222,124,650,659,839.00	2,418,925,581,107,200.00
• Microsoft 549,755,813,888MB Ram	8,444,249,301,319,679.00	4,837,851,162,214,400.00
• Microsoft 1,099,511,627,776MB Ram	16,888,498,602,639,359.00	9,675,702,324,428,800.00
• Microsoft 2,199,023,255,552MB Ram	33,776,997,205,278,719.00	19,351,404,648,857,600.00
• Microsoft 4,398,046,511,104MB Ram	67,553,994,410,557,439.00	38,702,809,297,715,200.00
• Microsoft 8,796,093,022,208MB Ram	135,107,988,821,114,879.00	77,405,618,595,430,400.00
• Microsoft 17,592,186,044,416MB Ram	270,215,977,642,229,759.00	154,811,237,190,860,800.00
• Microsoft 35,184,372,088,832MB Ram	540,431,955,284,459,519.00	309,622,474,381,721,600.00
• Microsoft 70,368,744,177,664MB Ram	1,080,863,910,568,919.00	619,244,948,763,443,200.00
• Microsoft 140,737,488,355,328MB Ram	2,161,727,821,137,839.00	1,238,489,897,526,886,400.00
• Microsoft 281,474,976,710,656MB Ram	4,323,455,642,275,679.00	2,476,979,795,053,772,800.00
• Microsoft 562,949,953,421,312MB Ram	8,646,911,284,551,359.00	4,953,959,590,107,545,600.00
• Microsoft 1,125,899,906,842,624MB Ram	17,293,822,569,102,719.00	9,907,919,180,215,091,200.00
• Microsoft 2,251,799,813,685,248MB Ram	34,587,645,138,205,439.00	19,815,838,360,430,182,400.00
• Microsoft 4,503,599,627,370,496MB Ram	69,175,290,276,410,879.00	39,631,676,720,860,364,800.00
• Microsoft 9,007,199,254,740,992MB Ram	138,350,580,552,821,759.00	79,263,353,441,720,729,600.00
• Microsoft 18,014,398,509,481,984MB Ram	276,701,161,105,643,519.00	158,526,706,883,441,459,200.00
• Microsoft 36,028,797,018,963,968MB Ram	553,402,322,211,287,039.00	317,053,413,766,882,918,400.00
• Microsoft 72,057,594,037,927,936MB Ram	1,106,804,644,422,574,079.00	634,106,827,533,765,836,800.00
• Microsoft 144,115,188,075,855,872MB Ram	2,213,609,288,845,148,159.00	1,268,213,655,067,531,673,600.00
• Microsoft 288,230,376,151,711,744MB Ram	4,427,218,577,690,296,319.00	2,536,427,310,135,063,347,200.00
• Microsoft 576,460,752,303,423,488MB Ram	8,854,437,155,380,592,639.00	5,072,854,620,270,126,694,400.00
• Microsoft 1,152,921,504,606,846,976MB Ram	17,708,874,310,761,185,279.00	10,145,709,240,540,253,388,800.00
• Microsoft 2,305,843,009,213,693,952MB Ram	35,417,748,621,522,370,559.00	20,291,418,481,080,506,777,600.00
• Microsoft 4,611,686,018,427,387,904MB Ram	70,835,497,243,044,741,119.00	40,582,836,962,161,013,555,200.00
• Microsoft 9,223,372,036,854,775,808MB Ram	141,670,994,486,089,482,239.00	81,165,673,924,322,027,110,400.00
• Microsoft 18,446,744,073,709,551,616MB Ram	283,341,988,972,178,964,479.00	162,331,347,848,644,054,220,800.00
• Microsoft 36,893,4		

Systems

Accessories

Accessories

Accessories

Miscellaneous

ERG/68000 MINI-SYSTEMS

☐ Full IEEE 696/S100 compatibility

HARDWARE OPTIONS

- ☐ 8 MHz or 10 MHz 68000
- ☐ CPU Memory Management
- ☐ Multiple Port. intelligent I/O
- ☐ 256K Dynamic RAM, with full parity (150 nsec)
- ☐ 8" D/D, D/S floppy disk drives
- ☐ 5MB-32MB hard disk drives
- ☐ Full DMA host adaptor
- ☐ 20MB tape streamer
- ☐ 10 to 20 slot backplane
- ☐ 30 amp power supply

SOFTWARE OPTIONS

- ☐ 68K FORTH¹ systems language with MACRO assembler and META Compiler
- ☐ Fast Floating Point package
- ☐ Motorola's MACSUBUG
- ☐ IDRIS² operating system with C, PASCAL, FORTRAN 77, 68K-BASIC¹ compilers
- ☐ CP/M - 68K² O/S with C, Assembler and 68K BASIC

Trademark¹ ERG, Inc.

² Whitsmitha

*Digital Research

30 day delivery
with valid Purchase Order

OEM prices available
For CPU, integrated Card
Sets or Systems

Empirical Research Group, Inc.
P.O. Box 1176
Milton, WA 98354
206-631-4855

195yad1

Design Line Micro Work Stations

ONLY
\$175
RETAIL

- A range of work stations designed specifically to house all micro-computers.
- Delivered heavily packed, in self-assembly form needing only a Phillips screwdriver and a few minutes of your time to assemble.
- Manufactured from 1" all wood, solid core particle board surfaced with hard-wearing melamine veneer, available in either Oak or Walnut.
- All models have discrete rear slot for wiring, and paper in-feed at both levels.
- Extremely strong and rigid when assembled.

Call for Descriptive Brochure

Dealer & Distributor
inquiries invited
(415) 365-0940

TOTAL
SYSTEMS
DESIGN, Inc.

635 Blair Island Rd., Ste. 100
Redwood City, CA 94062

Publications

Publications

Supplies

MICRO MOONLIGHTER NEWSLETTER

The ONLY publication devoted exclusively to helping you create, build, and maintain a home-based business using your micro-system. SUBSCRIBE NOW to what may be the most important publication in YOUR FUTURE!

1 Year (12 issues) only \$25 U.S., \$29 Canada, \$35 World Wide

J. Norman Goode, Publisher

Micro Moonlighter Newsletter
2115-W Bernard Avenue • Nashville, TN 37212

Visa and Mastercard welcome. Send account number and expiration date.

You'll get
great results
Advertising
in
InfoWorld
Classifieds
Try Us!!

WANT TO SAVE MONEY?

Computer Co-Op now forming for all areas. For info send name, address, telephone # and type of computer to:

MURRAY GILDEN
P.O. Box 5369
SHERMAN OAKS, CA 91413

WordStar[®] User's
Are you tired of thumbing books and manuals to find the right command? Order the "Word Processor's Krutch!" A handy wall-chart which gives quick reference to more than 140 WordStar commands. Send \$3.00 in check to:
Synkron Computer Services
P.O. Box 444, New Valley, CA 94062
WordStar[®] trademark of MicroPro Int'l.
#1 MSB-91

**"When You Want
To Be First,
Every Second
Counts"**

InfoWorld is the only microcomputer newspaper weekly. Our readers are intelligent professionals who depend on the up-to-date coverage InfoWorld delivers.

InfoWorld's classifieds work. Readers respond more readily to ads appearing in a weekly publication because they assume that the job opening is recent, and they want to be first in line.

Here's what one of our classifieds advertisers says:

"The response has, and continues to be overwhelming. I have run full page color advertisements in many of the larger computer publications without the success I have had with the classified ad I placed in InfoWorld."

Palmer T. Wolf
Advanced Operating Systems
Howard W. Sams
and Co., Inc.
A subsidiary of ITT

Get the results you want.
Advertise in the hottest micro magazine—the only micro-computer newspaperly.
InfoWorld consistently delivers!

InfoWorld
The Newspaper for Microcomputers Users

Contact: InfoWorld, Classified Ad Department, 530 Lytton Avenue, Palo Alto, CA 94301 (415) 328-4602 or call (800) 227-8365 from outside California, Toll Free

ADVERTISE YOUR BARGAINS TODAY IN INFOWORLD CLASSIFIEDS!

in California
(415) 328-4602

outside California
(800) 227-8365

Advertisers' Index

Page #

Adolph Gasser	464
American Digital Corporation	463
AMI Accountants Microsystems	31
Anderson-Bell	45
Ashten-Tate	14-15
California Computer Systems	57
Classified	467-71
Computer Business News	43
Computer Exchange	45
Computer Mail Order	44
Computer Products Int'l	466
Computer Service Center	462
Computers Wholesale	454
Corvus Systems	42
Corvus Systems	42
CPU Shop	28
Data Access Group	59
Data Source Systems	18
Data Technology Industries	36
Designer Software	45
Digital Marketing	2
Digital Research	24-25
Dimension 4	10
DJR Associates	40
D Punch	19
800 Software	7
EAM Software Inc.	405
Emerald Valley	26-27
Emeritus Software Library	6
Essex Data Systems	405
Excubator	10
Friends Software	44
G and G Engineering	38
Gauge Group, The	16
Gonboul ComputPro	16
Insoft	4
Integrant	56
JIT Systems	53
Jupiter Island Corp.	53
Key Microsystems	32
Leadsoft	3
Link Systems	39
Lotus Development Co.	16
M. A. COM OSI	29
Mabu Commercial Terminals	33
Micro Art Corporation	42
Micro Business Computers	43
Microbus	26-27
Micro Instructional	42
Micro Mart Inc.	32
Micro Pro International	50-51
Micro Tech Exports	4
Mini-Micro Mart	46
NEC America	54
North Star Computers	40-41
Pirates Harbor	12-15
Quamchess	58
Rapid Access Marketplace	47-48
Realworld Software	59
Readers Digest	22
Redgate Publishing	52
Reprint	68
Select Information	5
Semi Disk Systems	12
Sigma One Lane	19
Software Base	17
Software Store	403
Software Wholesale	403
Solutions Technology	68
State Computer Systems	33
Star Microsystems	30
Standard Software	11, 29-41
Surobe Inc.	13-20
Synco Inc.	46
Understanding Personal Computers	44
Waybern	405
Wildfire Publishing	52
Zhivago Advertising	462

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

WANT TO SELL YOUR MICRO OR PERIPHERAL? Tell readers in InfoWorld Classifieds.

The puzzling case of the missing missile

By Michael Swaine, IV Staff

"One of my first cases," Mr. Usasi began, standing at his window and watching the morning fog burn off, "was my only case for the military."

His assistant, Casey Standard, had decided a few minutes before to rearrange the files. Spread out in a tight arc on the carpet, in a dozen and a half untidy mounds around her, were the records of hundreds of past cases—Mr. Usasi's career as a detective. In the center of the arc Casey Standard sat, legs akimbo, back to the lifting fog, shuffling papers from pile to pile, humming.

"Tell me about it," she said. He turned around slowly, lost in thought. "It was a case of a missing missile," he said, then broke off abruptly when he saw the tableau on

"Holy ICBM."

"Approximately what one of the NASA engineers said. Fortunately the pilot had typed and sent a message on a special encoding nonvoice transceiver just before the force of the landing rendered him unconscious. Although the ground crew knew the kind of code employed, they did not have the key. And the missile might strike anywhere nearby at any second. They sent out the message immediately to anyone they thought might be able to help."

"What kind of code was it?"

"A letter-substitution cipher."

Casey Standard resumed her seat on the floor, balancing a cup of instant coffee on one palm. "Simple. You just count letter frequencies. E is the most common, followed by T..."



the floor, his assistant lotus-positioned in its center. He sighed, turned back to the window. "It involved a missing missile."

"You said that. There was an insistent whistle, and she got up and stepped over a mound of papers to go to the outer office to rescue the teakettle from the hot plate."

"I had gone to NASA's Ames Research Center to consult with a physicist of my acquaintance, when a message came in that a missile had become lost somewhere over Nevada."

"Wow," she said from the doorway. "And they let you listen?"

"They may possibly have forgotten for the moment that I was there. I had already taken leave of my friend and stepped into the hall."

"Hmm. Don't they hang spies?"

"Apparently a pilot had taken a jet aloft carrying a missile, and had been forced to make a rough landing—before which, to avoid detonating the missile, the pilot launched it."

"An unfalling technique when the message is long," he cut in. "Unfortunately in the present case, the message had only 26 letters."

"A toughie."

"Yes. They knew only that the message concerned the missile."

"But you solved it for them."

"It was simple, really."

He walked around her to the outer office to pour himself water for tea. He took some time at it and on reentering the room, said, "It may have been Walt Kelly who wrote,

When inspiration stalks the stems,

And slinks in sudden leaves,

Masquerades as mushroom beds,

And artlessly deceives;

Then hacking through the undergrowth

We spy with gaze oblique

In gnarled roots that trip our tread

The very path we seek."

She stared at him. "What the heck is that supposed to mean?"

He frowned. "The logic is somewhat contorted, but I take it to be a celebration of complexity for its own sake, a paean to the baroque. The final couplet seems clear enough: in the very coruscations that so confound us may lie a do, a path, a way."

"But what does that have to do with missiles?"

"Nothing, nor do I, if given a choice. I cannot imagine why I brought the subject up. The poem, now, is a sort of puzzlist's conceit."

"Not a clue?"

"Ms. Standard, what earthly good would a clue do you without the encrypted message itself?" he asked, slipping in behind his desk and gazing in dismay at the clutter on his floor.

Grimacing, she held up a slip of paper. "I found it," she said.

"Then a clue you must have," he responded. "If my office is ever to be restored to normal. Besides simply substituting one letter for another, X for Z, for example, this cipher shifts each letter in the message a number of letters of the alphabet. The number is the ordinal position of the letter in the message. That is, the first letter of the message is shifted one letter alphabetically; from M to S, say, and the second letter of the message is shifted two letters; if it is J, it becomes an L."

"First the letter substitution, then this shift, right?"

"Correct."

"Should be a snap," she said.

The message:

KPKIQ, OTEFWPX FATU ZEPQ TX FKID.

About the dice problem, (InfoWorld, September 27): the only possible answer is that the dice had just two sides; that is, they were like coins or Go stones. Any even number n of sides might have worked, one numbered half 0 and half n. But since Usasi never saw at the same time two sides of the same die numbered the same way, only two two-sided "dice" numbered 0, 2 and 1, 2 would work.

For the RPN maze, (InfoWorld, October 11): see the drawing above, and note that the maze does something a conventional maze can't do: it crosses its own path. The value that pops out the top of the maze is 3.

Next Time

You think you've seen everything? Well watch out, Howard Cosell. Next week InfoWorld has its first sports section.

For years microcomputer users have known the cathartic pleasure of playing sports games on their machines, but games are only one sports-related use of the devices.

Managers, coaches and announcers have all found that microcomputers can be useful tools.

We'll look at a creative group of people who have started their own baseball league using an

Apple II, and others who believe that their micro may help them beat the weekly point spread in NFL games.

We'll have a hardware review of the MicroBuffer, a hardware spooler or print buffer for the Epson MX-80 from Practical Peripherals, Inc. Software reviews will include a group of statistical programs for the Apple II from Human Systems Dynamics, the Lattice C compiler for systems using MS-DOS, and FORTRAN for the IBM Personal Computer.

RealWorld™ Business Software for Micros.

If our software wasn't so good, we couldn't back it so well. Other software companies talk a lot about how efficient, reliable and easy to use their products are. So do we. But we put our money where our mouth is...with a full 30 day money-back guarantee to any OEM, software house, consultant or computer manufacturer who isn't satisfied with our RealWorld™ application packages.

How can we do it? Experience. Our Accounts Receivable, Order Entry/Inventory, Sales Analysis, Accounts Payable, Payroll and General Ledger packages are derived from the field-proven and award-winning MCBA® applications, with over 10,000 copies in use on minicomputers worldwide.

And we've already sold over 10,000 additional copies of this microcomputer version, which is written in RM/COBOL® and runs on a wide range of popular 8 and 16 bit single and multi-user operating systems. Source code and complete documentation are available.

Compatible hardware includes the IBM® and DEC® personal computers, Apple® III (with CP/M®), TeleVideo®, Altos®, ONYX®, Xerox®, HP-125 and Northstar, as well as dozens of others, including DEC's® PDP-11.®

MBSI RealWorld business software. Experienced. Profitable to sell. Supportable. Satisfaction guaranteed.

Please send more information about MBSI's RealWorld general business software to:

Name _____ Title _____

Address _____

City _____ State _____ Zip _____

Phone _____

Micro Business Software, Inc., Dover Road, Chichester, NH 03263
CODE RMW21018

GUARANTEED SATISFACTION



16-Bit
Version
Now Available.

Visit Booth #2726 at
Fall-COMDEX in Las Vegas

mbsi[®]

Micro Business Software, Inc.
Dover Road
Chichester, NH 03263
(603) 798-5700

MCBA, RM/COBOL, IBM, DEC, Apple, CP/M, TeleVideo, Altos, ONYX, Xerox and PDP are trademarks, respectively, of Mini-Computer Business Application, Inc., Ryan-McFarland Corp., International Business Machines Corp., Digital Equipment Corp., Apple Computer's, Digital Research, TeleVideo Systems Inc., Altos Computer Systems, ONYX Computer Systems, Xerox Corp. and Digital Equipment Corp.

CompuPro Spoken Here

...8 and / or 16 Bits

CompuPro speaks your language - 8 bit, 16 bit, or 8 and 16 bit - while delivering exceptional performance and reliability. As **Interface Age** said about our ground-breaking dual **CPU 8085/88** processor, "The (8 bit) 8085 was more than a third faster than any 8 bit micro we have tested to date...the (16 bit) 8088 (was) almost twice as quick as the identically-engined IBM Personal Computer utilizing a similar software package". The **Silicon Gulch Gazette** described **CompuPro** machines as "Definitely reliable and potent...likely to be a major product for serious technologists who demand trustworthy hardware".

We couldn't have said it better. See what people are talking about at your nearest **CompuPro Authorized Systems Center**.

Byte Shop of Hayward
1122 B Street
Hayward, CA 94541
(415) 537-2983

Computer Center, Inc.
1514 University Avenue
Berkeley, CA 94703
(415) 845-6366

Digital Deli
80 W. El Camino Real
Mountain View, CA 94040
(415) 961-2670

G & G Engineering
1922 Republic Avenue
San Leandro, CA 94577
(415) 895-0798

G & G Engineering
351 California Street
Suite 515
San Francisco, CA 94104
(415) 391-4570

JR Systems, Inc.
8617 Bunnell Drive
Potomac, MD 20854
(301) 299-4522

Key Microsystems
978 Tiogue Avenue
Coventry, RI 02816
(401) 828-7270

Key Microsystems
822 Boylston St.
Chestnut Hill, MA 02167
(617) 738-7305

Logic Systems
4800 Manzanita Avenue #21
Carmichael, CA 95608
(916) 971-3133

Matrix Computer Systems
720 Mendocino Avenue
Santa Rosa, CA 95401
(707) 542-0571

Micro Computer Technology
1549 W. Brandon Boulevard
Brandon, FL 33511
(813) 685-7659

Priority One Electronics
9161 Deering Avenue
Chatsworth, CA 91311
(800) 423-5922, (213) 709-5464

S-100 Inc.
14425 N. 79th St. #B
Scottsdale, AZ 85260
(800) 528-3138, (602) 991-7870



CompuPro division, Godbout Electronics,
Box 2355 Oakland Airport, CA 94614